Usability of iPad Apps and Websites

2nd edition

By Raluca Budiu and Jakob Nielsen

NN/g
Nielsen Norman Group

WWW.NNGROUP.COM | 48105 WARM SPRINGS BLVD., FREMONT CA 94539–7498 USA

We are making this report available for free to support our loyal audience of usability enthusiasts by providing empirical data about iPad usability. This report does not contain as many detailed and actionable design guidelines as we usually provide, because we focused on getting the report out as quickly as possible after the study sessions.

Even though this report is free, it is still copyrighted information, so we encourage you to not distribute it on the Internet—or otherwise—but instead link to its home on our website where other readers can download it if they are interested. Please do not link directly to the PDF file, but rather follow the guideline to reduce "PDF shock" by linking to the gateway page that summarizes the report within the format of a simple Web page:
http://www.nngroup.com/reports/mobile/ipad/

The first edition of our iPad report (from 2010) is also available for free download at this website. Usually, when we publish a revised edition of a research report, we discontinue the older editions. In this case, however, we're keeping both the 1st edition and the 2nd edition available, because they both provide interesting insights into iPad usability and present quite different sets of screenshots and examples. Even though the first edition tested older apps it's still worth remembering the lessons from the mistakes made in these early designs. If you don't remember history, you'll be doomed to repeat it.

Thus, if you find the current report interesting, we recommend that you **also read the 1st edition**.

Contents

Executive Summary

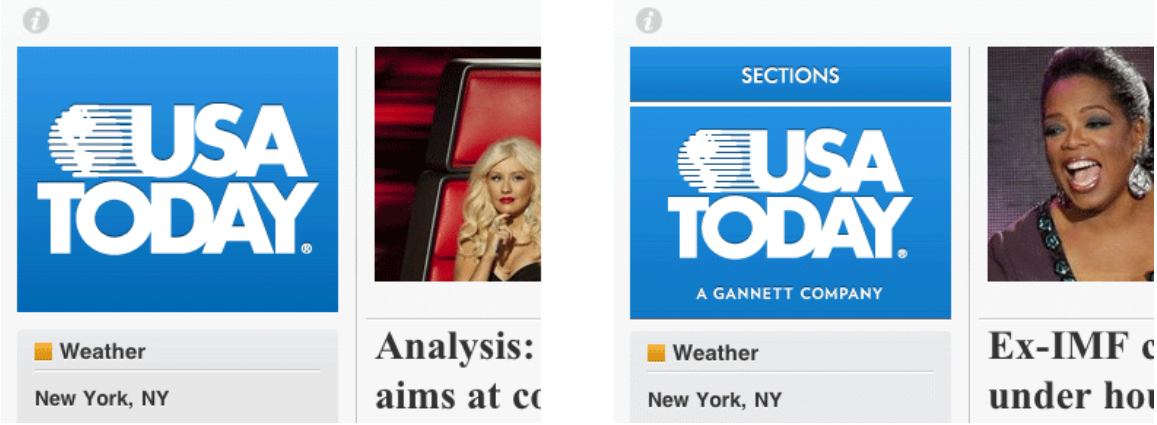
A year after our first usability study of iPad apps, it's nice to see that iPad user interfaces have become decidedly less whacky. It's even better to see good uptake of several of our recommendations from last year, including apps with:

- back buttons,
- broader use of search,
- homepages, and
- direct access to articles by touching headlines on the front page.

Even so, this year's testing still found many cases in which users accidentally touched something and couldn't find their way back to their start point, as well as magazine apps that required multiple steps to access the table of contents.

One of the worst designs last year was USA Today's section navigation, which required users to touch the newspaper logo despite the complete lack of any perceived affordance that the logo would have this effect. During our new testing earlier this month, several users had the same problems as last year's test participants, even though we recruited people with more iPad experience.

Happily, a few days after our test sessions, USA Today released a new version of their app, with somewhat improved navigation:



USA Today section navigation.
Left: As tested a year ago and in the 2nd study. Right: The new design with an explicit *Sections* button.

One of our test users was a regular user of this app. Although he said he'd eventually discovered the Section navigation on his own, during the test session he complained bitterly about how difficult it had been to find. Users rarely remember the details of interaction design widgets, which is one of the key reasons that it's better to watch users than to ask them about usability. The fact that this user recalled his troubles months later is testament to how strikingly annoying the old navigation design was. It's also astonishing that it took a full year to get this usability flaw changed after we originally reported it.

USER RESEARCH

Normally, it wouldn't be worth doing a new study this soon: usability guidelines change very slowly because they derive from human behavior, not technology. However, in this case, it's reasonable to conduct new research now, a year after the iPad launch.

Our original research necessarily tested users who had no prior experience using iPads. A complete lack of experience is obviously not representative of typical tablet usability. At this point, even first-time users of websites or apps will have visited many websites before on the iPad and will have used many apps before opening a new app for the first time.

For the new study, we recruited users with at least two months' experience using their iPads. Typically, we recruit people with at least a year's experience. However, because the iPad was released only slightly more than a year before our study, anybody with a full year's experience would have been a very early adopter—and thus completely unrepresentative of mainstream users.

In any case, two months' iPad use is definitely enough to learn the user interface conventions and to have racked up substantial time using touchscreen apps.

A second difference between the two studies is that we originally tested the launch applications that shipped at the same time as the iPad itself; they were thus developed by teams working in isolation under Apple-imposed secrecy that prevented them from gaining user feedback. In our first report, many of the bad designs we documented were due not to bad designers, but rather to the inevitable outcome of non-user-centered design projects.

In contrast, the apps and sites tested in the new study were designed by teams that benefited both from our original usability report and from whatever user feedback they'd collected on their own during the past year.

In the new study, we systematically tested 26 iPad apps and 6 websites. We also tested many apps that our test participants had installed on their iPads, but these tests were less systematic, with typically only a single user per app.

In total, 16 iPad users participated in the new study. Half were men, half were women. The age distribution was fairly even for fourteen users between the ages of 21–50 years; we also had two users older than 50. Occupations spanned the gamut, from personal chef to realtor to vice president of human resources.

Our insights about iPad usability are further informed by nonproprietary findings from various client studies and by many aspects of last year's original research, which continue to be relevant.

REPLICATED FINDINGS

Many of last year's usability findings were seen again this year:

- **Read–tap asymmetry** for websites, with content that was large enough to read but too small to tap. We did see some examples across a few websites that were designed to work well on tablets, with bigger touchable areas. For example, Virgin America's reservation page let users touch anywhere in the entire table cell containing a desired departure, as opposed to having to touch the much smaller area represented by the radio button (or even its label).
- **Websites worked fairly well** in the standard iPad browser as long as users didn't have complex tasks; focusing on reading and looking at pictures or video was relatively easy. (If your service requires substantial interaction, consider an app instead of a site.)
- **Touchable areas were too small** in many apps, as well as too close together, increasing the risk of touching the wrong one.
- **Accidental activation** due to unintended touches again caused trouble, particularly in apps lacking a *Back* button.
- **Low discoverability**, with active areas that didn't look touchable.
- **Users disliked typing** on the touchscreen and thus avoided the registration process.

Last year's main finding was not a big issue this year: users weren't as tormented by widely diverging user interfaces. Apps have become more consistent and standardized, making them easier to use.

NEW FINDINGS

We thought we had driven a stake through splash screens many years ago and eradicated them from the Web, but apparently splash screens are super-vampires that can haunt users from beyond the grave. Several new iPad apps have long introductory segments that might be entertaining the first time, but soon wear out their welcome. Bad on sites, bad in apps. Don't.

Swipe ambiguity plagued users when multiple items on the same screen could be swiped. Carousels often caused this usability problem in apps that also relied on swiping to move between pages. Many users couldn't turn the page because they swiped in the wrong spot. Their typical conclusion? The app is broken.

Many apps squeezed information into too-small areas, making it harder to recognize and manipulate. In a related problem, apps featured too much navigation. This design problem was so prevalent that it deserves its own acronym: TMN. While it's true that our seminar on navigation design[1] covers 25 different navigation techniques, any given user interface should contain only a few. These two problems interact, because a larger number navigation options gives each one less space.

One example of excess navigation is the content popovers that many apps use to display thumbnails of available articles. Sometimes the popovers appear as menus or carousels, and sometimes they work by scrubbing a slider. Whatever the implementation, these long lists of thumbnails had lower usability than homepage-like tables of contents, which users could return to when they wanted to navigate to different locations rather than simply continuing with the next article.

TABLETS ARE SHARED DEVICES

Except for people who lived alone, our study participants uniformly reported sharing their iPads with other family members. When we asked them to walk us through the apps on their tablet, people frequently came across apps that someone else in their family had installed.

The iPad's shared nature contrasts with the much more personal nature of mobile phones, which are typically owned and used by single individuals.

Obviously, tablets might become truly personal devices in the future as competition drives down the prices. But for now, you should assume that you're designing for a multi-user device. For example, users might be reluctant to stay permanently signed in on an app, and they'll still forget their passwords. It's also important to design recognizable application icons so they'll stand out in the crowded listings of several users' apps.

WHAT ARE IPADS USED FOR?

The most common uses reported by our participants were playing games, checking email and social networking sites, watching videos, and reading news. People also browsed the Web and performed some shopping-related research. But most users felt that it was easier to shop on their desktop computers. Some also worried about the security of e-commerce purchases on the iPad.

[1] http://www.nngroup.com/events/tutorials/info_arch_2.html

A common characteristic of all this iPad use is that it's heavily dominated by media consumption, except for the small amount of production involved in responding to emails.

About half the users carried the iPad with them frequently; the other half used it mainly at home or on longer trips.

We've come far in just a year. iPad usability is much improved, and people habitually use many apps. As always, this is no reason to relax our vigilance; new usability problems have appeared and the old ones haven't been totally vanquished. Mainly, though, the future is bright for touch-driven tablet user experience.

Research Method

The main purpose of our research was to assess the state of iPad application design and understand where the user interaction pain points are. Are there any common design mistakes that affect the users? What is easy and what is hard for users of iPad applications and websites?

This study comes one year after our first report on the usability of iPad sites and apps[2]. At the time of the first report, the iPad was one month old, and many of the apps freshly designed for that platform were drafted in the blind, without the benefit of user testing. Has there anything changed since then? After one year of using the iPad, do we know how to design more usable apps? These were also questions that we hoped to answer with our second study.

This section includes an overview of our research project. We used two different methods:

- Usability testing, and
- Expert reviews.

Usability testing. We conducted usability studies in Fremont, CA. We invited iPad owners to the lab and had them do a variety of tasks using both apps and websites. We also conducted a brief interview about their iPad-related habits, and asked them to show us some of the apps they had already installed on their device.

We observed users as they worked on the activities and encouraged them to think aloud.

A total of 16 people participated in the study. Each one-on-one session was scheduled for 90-minutes. See the *Methodology* chapter starting on page 110 for more information.

Expert Reviews. This report also includes observations and recommendations from conducting our own review of additional interfaces. We looked for both usability issues and areas that could increase usability success.

[2] "*Usability of iPad Apps and Websites, 1st edition*", available for download at http://www.nngroup.com/reports/mobile/ipad .

How People Use the iPad

At the beginning of our usability testing session, we asked our study participants to tell us what kinds of activities they did on their iPad. Because the sample is small, our data needs to be taken with a grain of salt.

WHAT

The iPad was used mostly for media consumption; the only slight exception to the rule being email. (Participants reported reading and also occasionally responding to email on their iPads).

Almost all participants in our sample reported using the iPad for games. The next most frequent activities were checking email and social network sites, watching movies and videos, and reading news. Several users mentioned that the iPad has replaced their laptop.

A word about e-commerce: Most of our users said that they had not done any purchases on the iPad. Some mentioned that they were unsure about how secure the iPad was, compared to other devices. Others felt that it was easier to shop on the desktop computer, especially on sites that were familiar to them. Shopping-related activities carried out on the iPad included researching an item, browsing, checking classifieds (e.g., Craigslist) or auctions (e.g., eBay).

WHO

All our participants who were not living alone mentioned that they shared their iPad with other members of their family. Children were often allowed to play games or watch videos on the iPad, but participants also shared their iPads with significant others. Because of that, the iPad was perceived as less personal than the iPhone.

One participant was talking about her insurance app:

> "Most things on my iPhone I have logged in — so they automatically go to where I am going. I like that. Since different people use this [I am not logged in] and I forgot my password…"

Many users had applications that they regarded as "theirs", and applications that were installed and used by someone else in their family. Often, they would not know what the other person's apps were and would also not use those apps.

One of our users was showing us his apps:

> "Patent [app] … This is all his stuff. The lawyer stuff is all his."

Occasionally, users did not know how to install an app or did not know their iTunes password because their spouse was usually the one doing the app installation and purchase.

None of our participants came from families with multiple iPads, although two participants mentioned that their spouse either used to have an iPad or was thinking to get one.

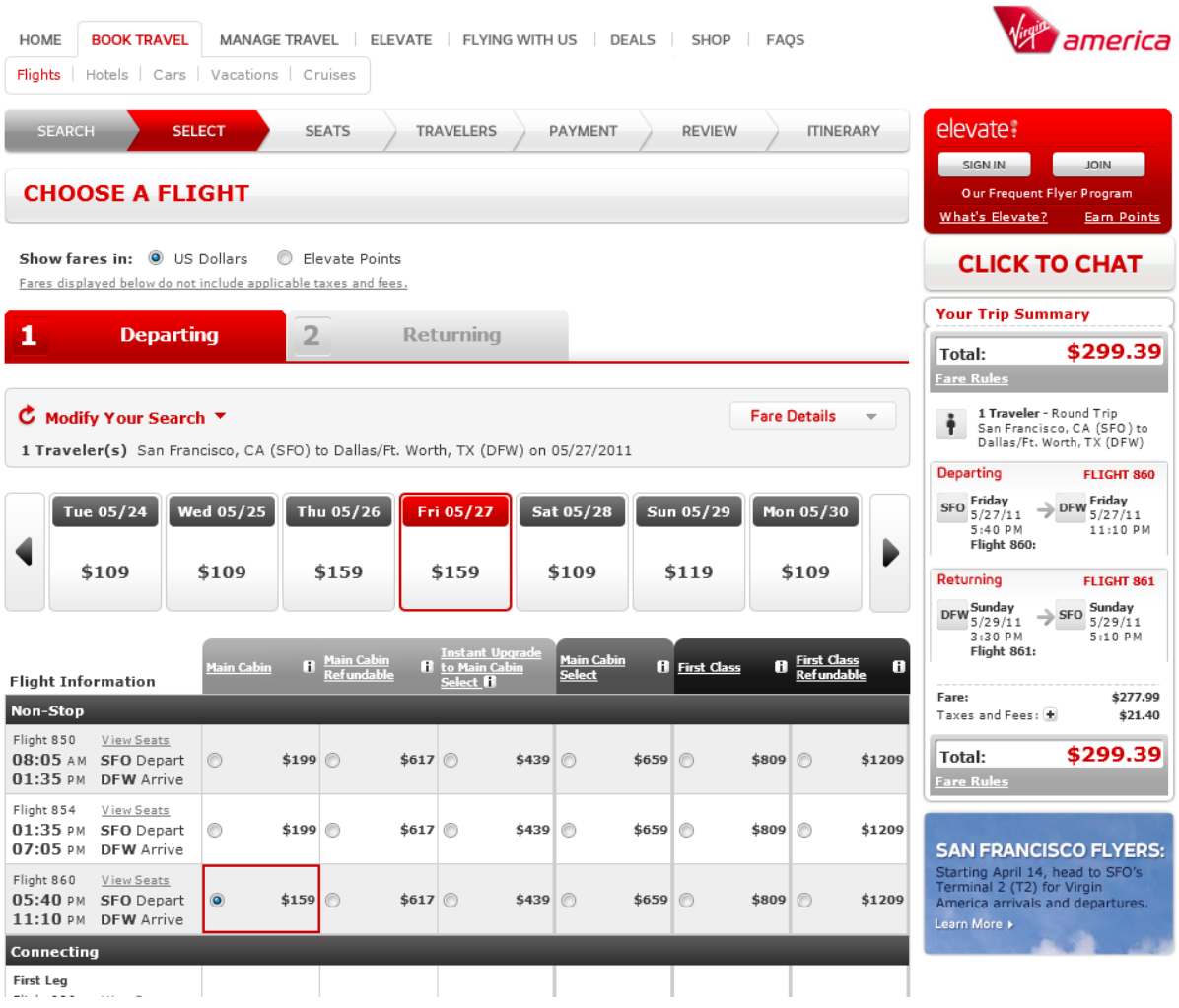
WHERE

About half of our participants carried the iPad with them frequently; the other users mentioned using it mostly at home and on longer trips. Many said that they will take the iPad with them if they anticipate long wait periods.

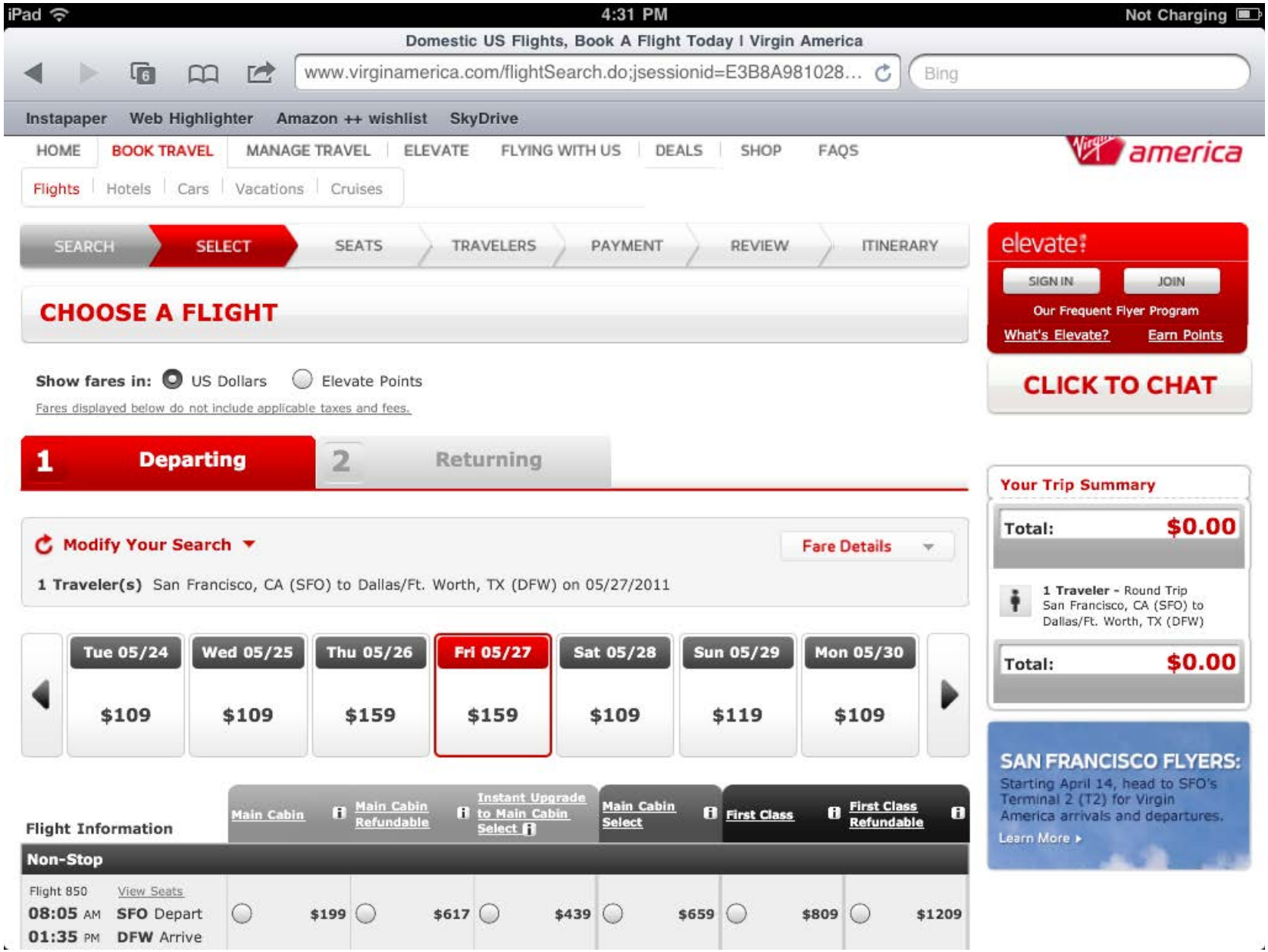
Website or App?

The findings that we noted last year still remain valid: full websites, designed for desktop computers, are fairly readable on the iPad and users can do a variety of consumption-related tasks easily. The read–tap asymmetry, which we pointed out last year, still holds true for most websites: the content is readable, but the links and widgets are too small to touch reliably.

Some websites do a better job than others when it comes to target size. Virgin America is an example: the site's relatively big buttons allow users to select options easily, especially in landscape orientation. The site leaves room for error: the radio buttons on the flight-selector page are padded, and users can touch anywhere in the rectangle containing each flight choice.



Virgin America website on the desktop.



Virgin America site on iPad in landscape orientation. Target sizes are relatively big. Although radio buttons look small, they are in fact padded: hitting anywhere in the corresponding box counts as a selection.

In our testing, a few tasks were performed both on the Web and using an application. In these cases, our participants were always successful on the Web[3]; a third of the corresponding tasks that involved apps ended in failure. There were two reasons for which some of the apps were less successful than the websites:

1. **The apps contained less content than the websites.**

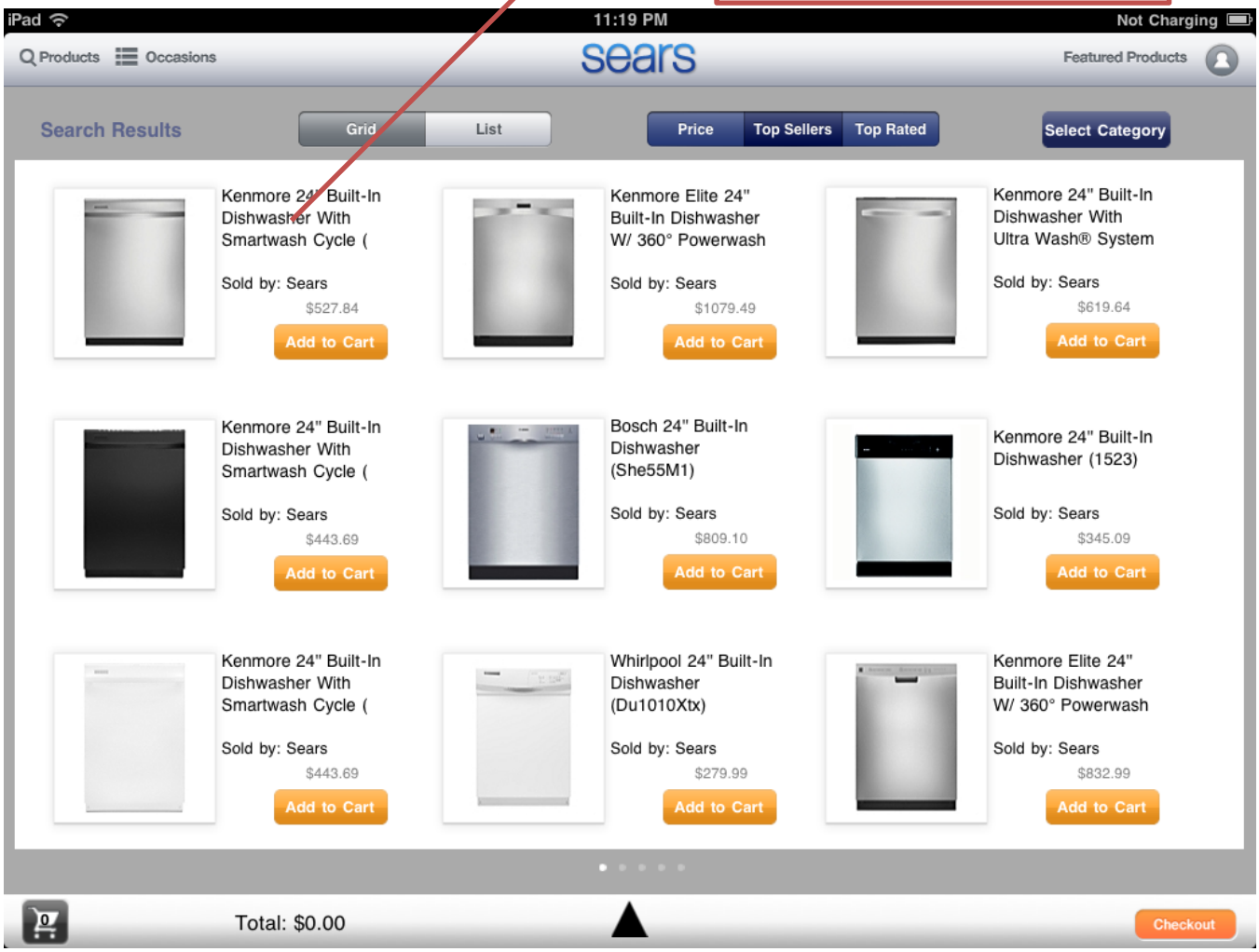
   An example of that was the Sears app. Our participants were looking for an energy-saving, water-saving, low noise dishwasher. The Sears app allowed users to select the dishwasher category, but they could not narrow down the results in any way. Moreover, the app did not have as much info as the website — there were fewer specifications and also no information about delivery or installation.

Sears app contains little information about this dishwasher. The specifications are not included. It's not clear what the delivery or installation costs are.

Unlike the Sears app, the Sears website allowed users to narrow down results according to several criteria. It also included more information about the products, and information about shipping and installation costs.

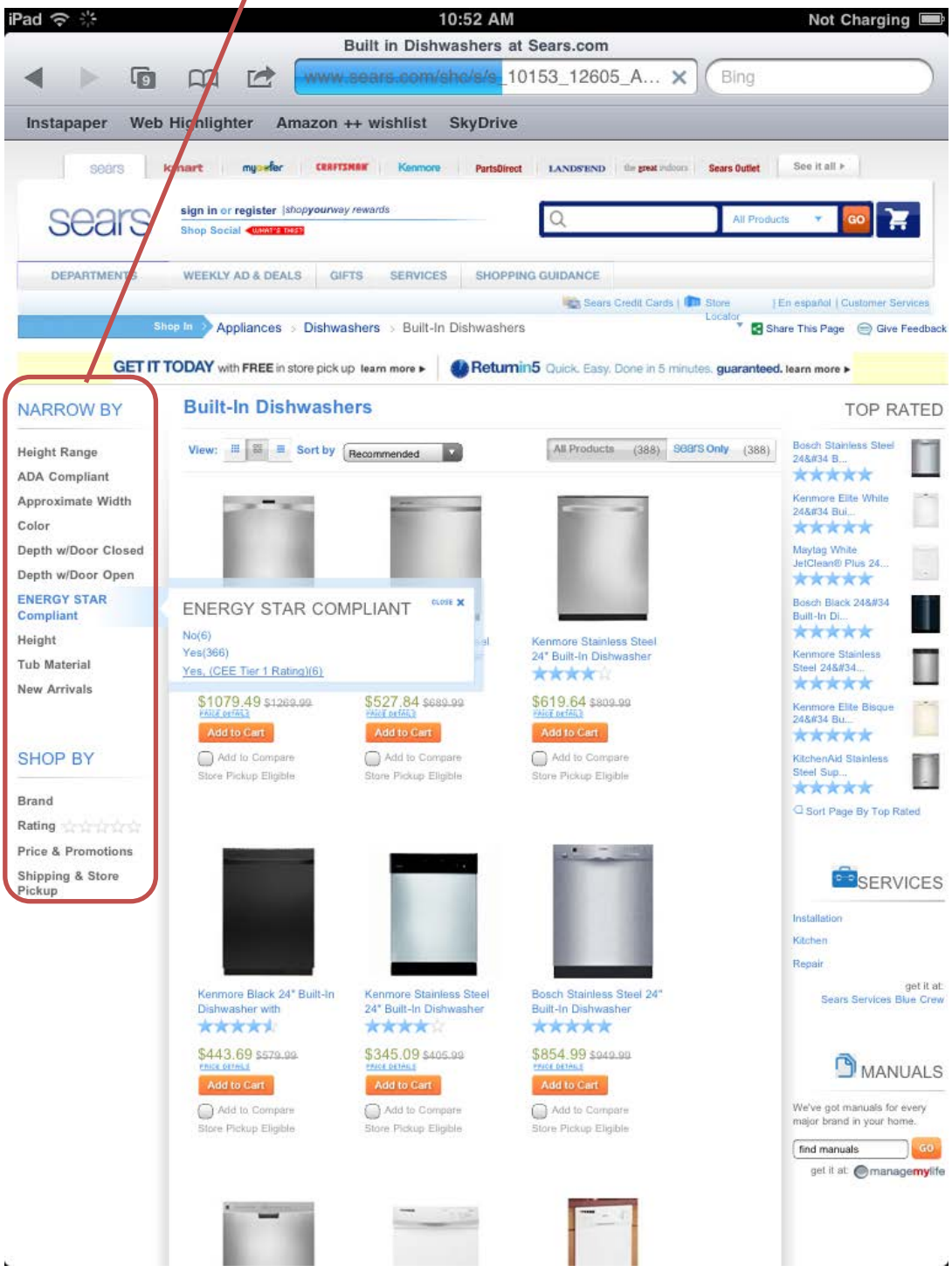
[3] There was one exception where both the website and the app were not working properly, due to the Zappos server being down.

Product ratings are not displayed, making it harder for users to select a product.

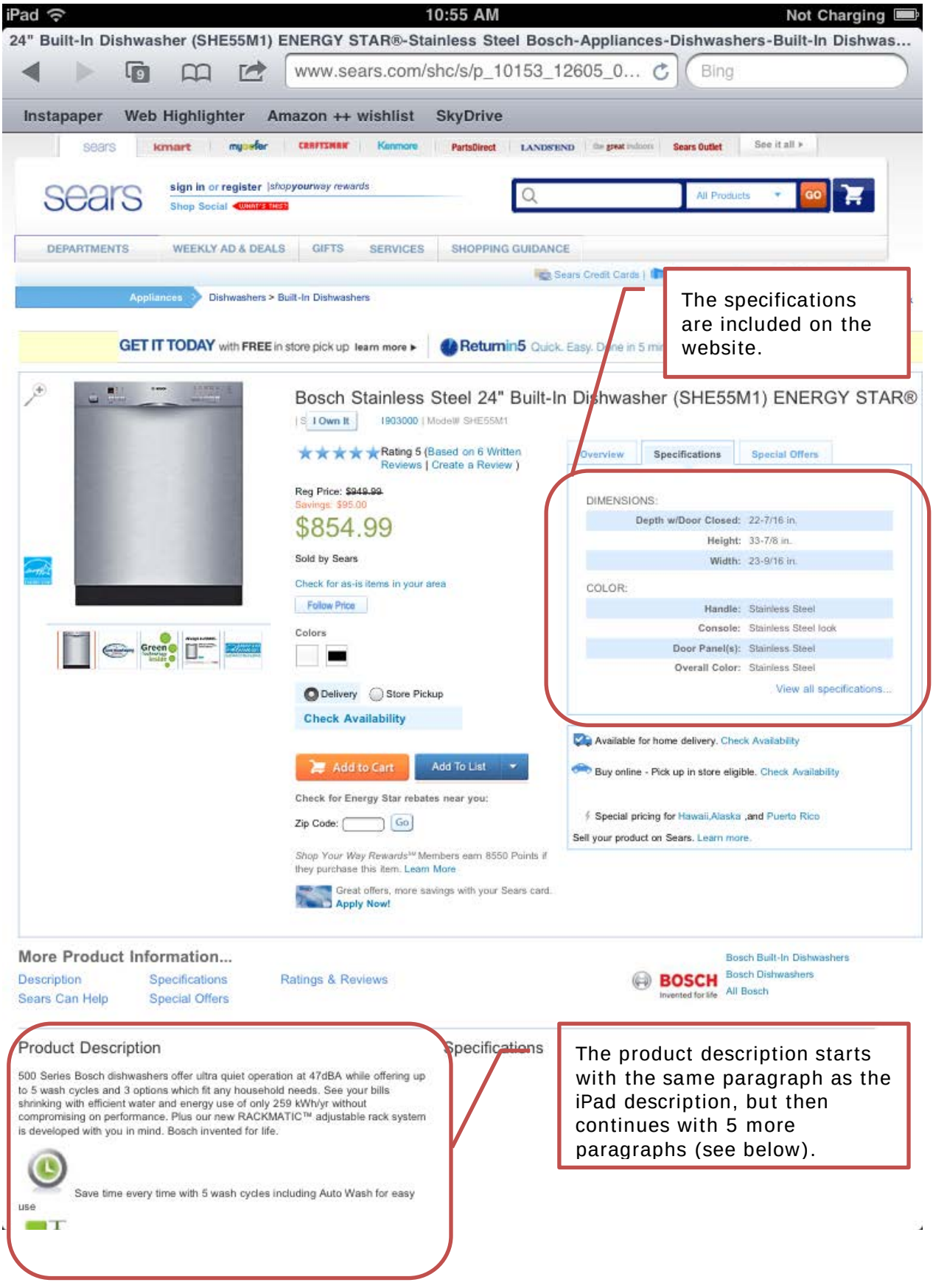


Sears app shows limited info in the search results. There is no way to narrow down the results.

Filters enable users to narrow down the list of products.



Sears.com shows the product ratings and also has available filters to narrow down the list.



The specifications are included on the website.

The product description starts with the same paragraph as the iPad description, but then continues with 5 more paragraphs (see below).

Save time every time with 5 wash cycles including Auto Wash for easy use

Fit 14 place settings with a New and Improved rack system

500 Series rack system includes; convenient handles on both racks, 4 flip tines, extra large flexible silverware basket and extra tall item sprinkler for item up to 22 in.
RackMatic® Automatically Adjustable Upper Rack with accessory baskety for complete flexibility

Save up to 30% on your energy bills with Half Load option

Want to do your dishes later? Use Delay Start to customize
Remove 99.99% of household bacteria with Sanitize Option

Be green and get the job done with Bosch by using only 3 gallons of water per cycle

Shrink energy use and your bill with 259kWh/yr.
Saving up to 25% more energy can only be delivered by Bosch's EcoAction™ Option

AquaStop: underneath the dishwasher there is a solid molded base with leak detector to eliminate the risk of leak damages

Concealed Flow-Through Water Heater™ prevents accidents and the melt of plasticware
At 47 dBA, this dishwasher almost cannot be heard when it is on

This product is:

Energy Star Qualified

Added on January 08, 2010

DIMENSIONS:	
Depth w/Door Closed:	22-7/16 in.
Height:	33-7/8 in.
Width:	23-9/16 in.
COLOR:	
Handle:	Stainless Steel
Console:	Stainless Steel look
Door Panel(s):	Stainless Steel
Overall Color:	Stainless Steel
CAPACITY:	
Interior Size:	TALLTUB
ENERGY:	
ENERGY STAR Compliant:	Yes
GENERAL FEATURES:	
Accepts Custom Panel:	No
Built-in Design:	Yes
Control Type:	Evolution Design electronic controls
Door Style:	Frameless
Fill & Drain Hose Included:	Yes, drain hose only
General Warranty:	1 year parts and labor
Item Weight:	111.3 lbs.
Portable Design:	No
Power Cord Included:	No

People Who Viewed This Item Also Viewed

Sears.com (website) contains a lot more product information than the iPad app.

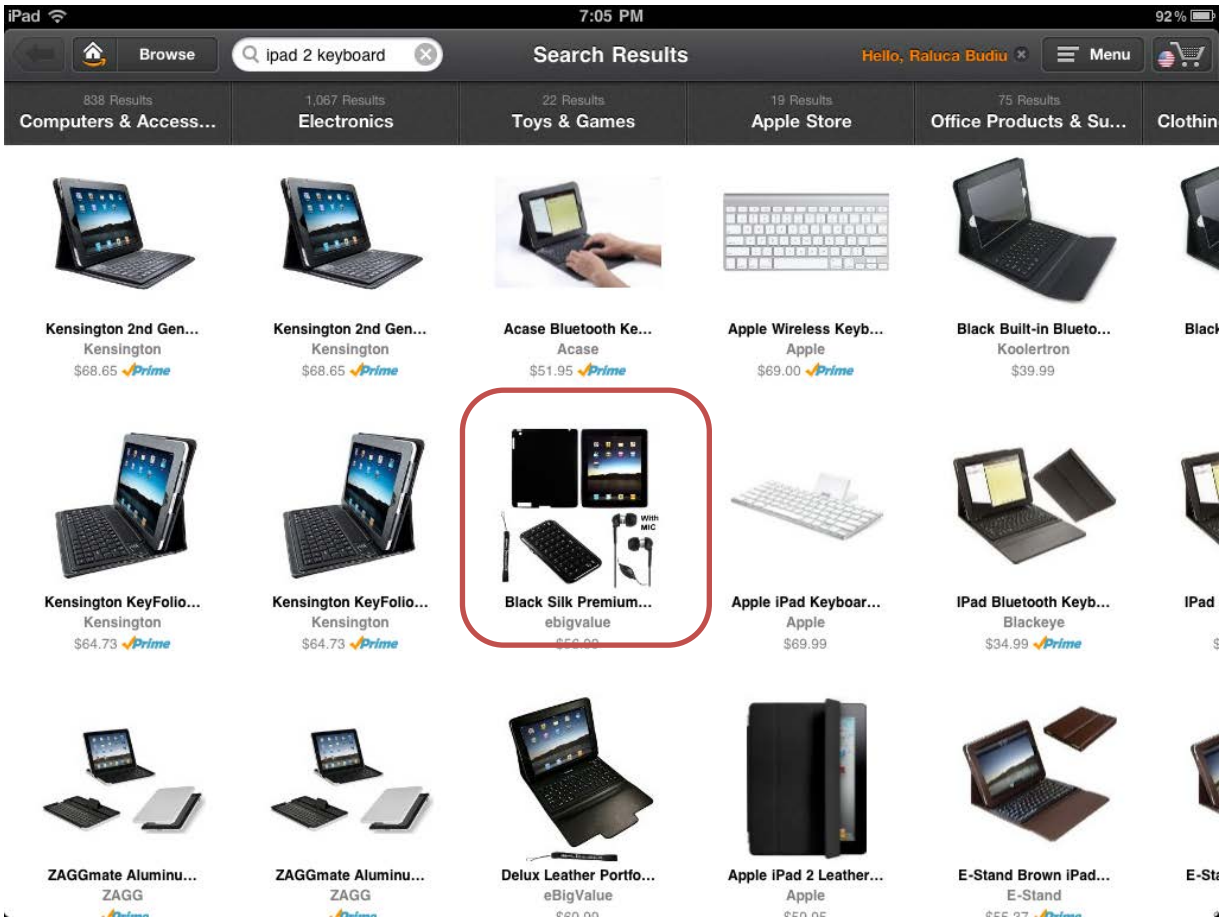
It looks almost like the Sears app was built for the mobile-phone user, who needs to get to content quickly and rarely looks for a lot of details.[4] Unfortunately, most iPad users do not use the iPad in truly mobile situations: you don't see many people walking in the store with their iPad in their hands, trying to figure out whether it's worth buying a dishwasher at Home Depot or they're better off going to Sears. Even users who take their iPad away from home use them in relatively relaxed situations, when they are waiting, or in between activities, or killing time. That kind of condensed, space-saving presentation of information that we often recommend for mobile-phone design does not apply to the iPad.

2. **The app design was confusing or the app made the user work more.**

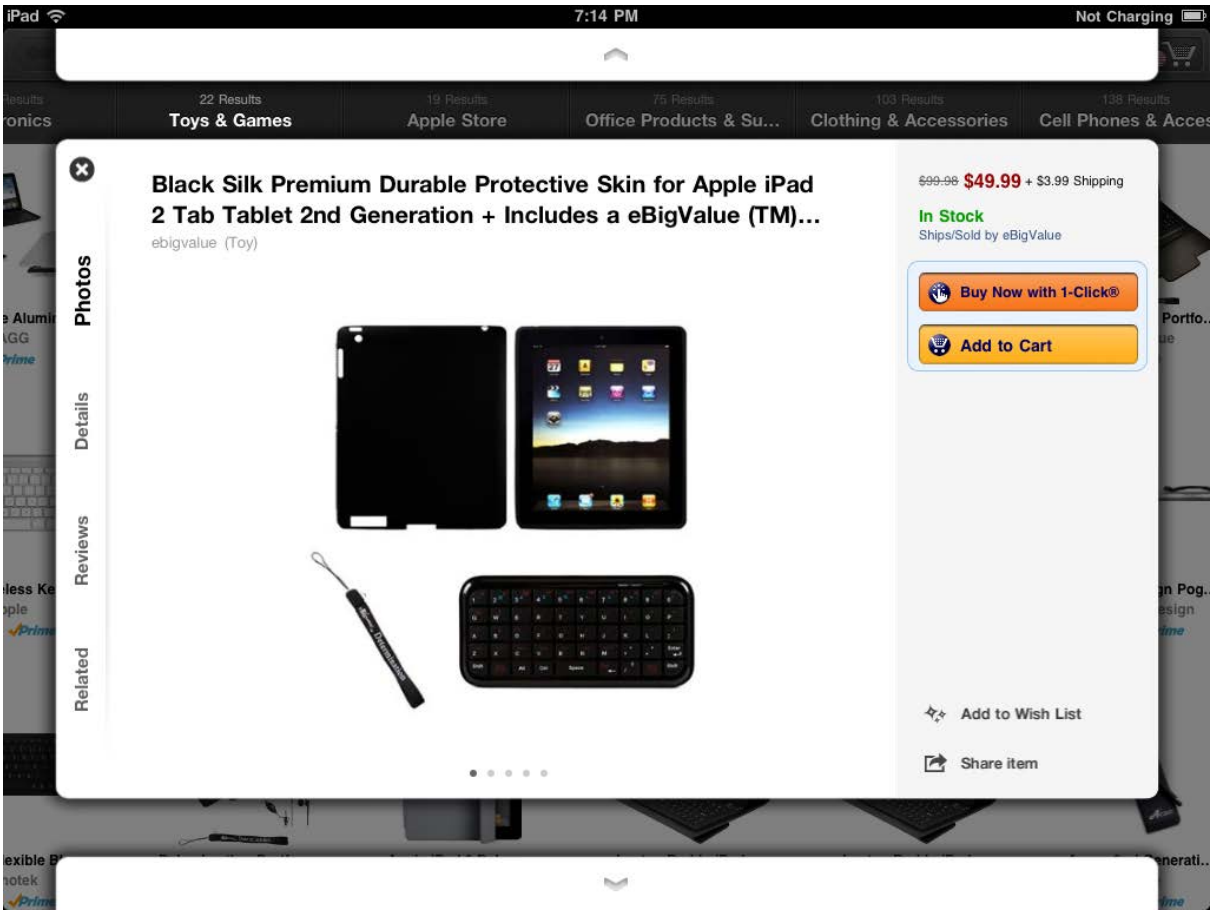
   In the case of Amazon Windowshop, users were surprised that the look-and-feel was different from the look-and-feel of the Amazon websites. Many users enjoyed the new design, but some were overwhelmed by the pictures and by the different look-and-feel.

   A user who was looking for an iPad keyboard picked an item that seemed to match her requirements. Because the product name was incomplete and the photo was misleading (it showed a keyboard), the item she had selected was in fact an iPad case. She tapped several times on the same item without realizing what it was and was ready to buy it. Only at the last minute, when reading the description more carefully, did she understand that the item was in fact an iPad skin not an iPad keyboard. She ended up going to the Amazon website and buying the product there.

[4] For more information about mobile-phone usability, please see the report about our research and design guidelines for this smaller class of devices, available for download at http://www.nngroup.com/reports/mobile/



Amazon Windowshop truncated the name of the products on the search results page.



Amazon Windowshop app. The product page did not show the full product name either. The picture led the user to believe that the product was a keyboard, when, in fact, it was an iPad case.

Another app that generated some failures was Washington Post. In order to access content, the app required the users to register. Our users had little interest in doing so, and felt that they could access the same content without registration by going to the Web.

One participant commented:

> "It's annoying to [have to] sign up. I don't want to give them my email [in the app]. […] Why would I give them my email if I can access the site without signing up?"

To quote another user:

> "Sometimes apps are easier, but sometimes they lack features [compared to the websites]."

Whenever apps lack features, users quit them for the websites.

SHOULD ALL COMPANIES HAVE AN IPAD APP?

Given that websites are fairly usable on the iPad, the answer is "no" — not everybody needs to have an iPad app, at least for for usability reasons. (There may be other reasons, such as marketing or even internal politics, for which companies may feel compelled to build an iPad app simply so that they can *say* that they have one even if it doesn't do customers any

good.) Most users still access websites through search, and even though people may fall for the ad for an iPad app on your website and may install that app, it doesn't mean that they are going to use it.

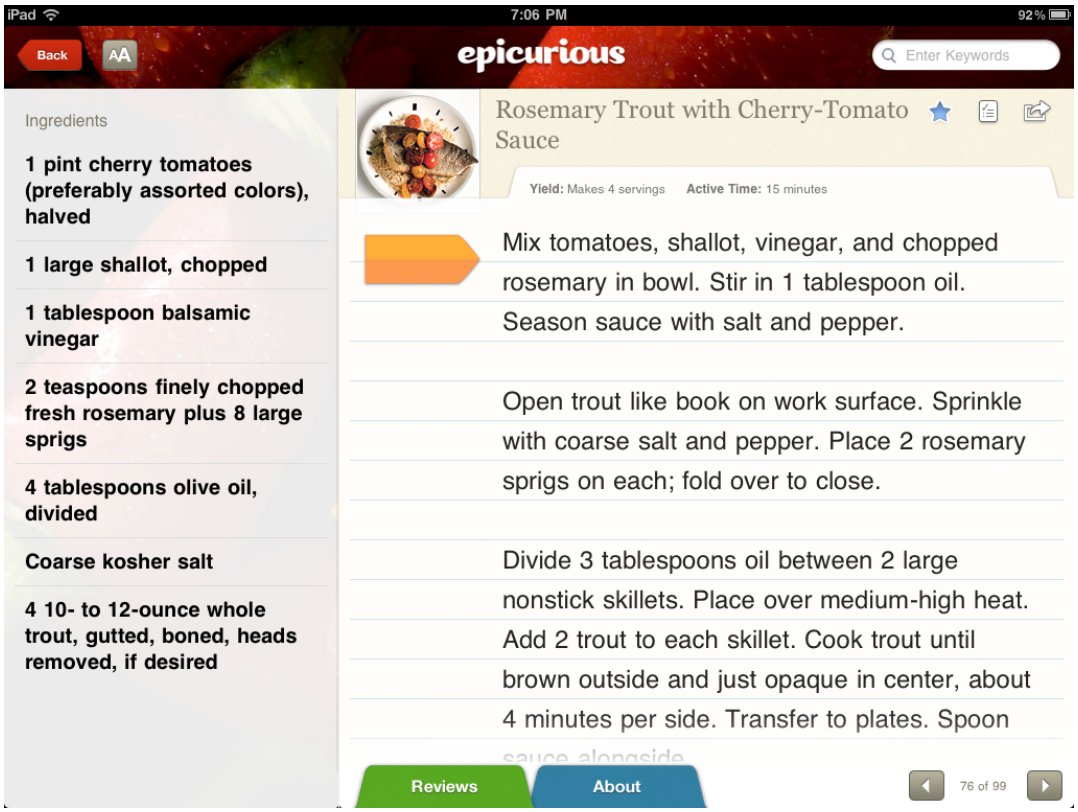
If you need an iPad app

1. Design for repeat users.

Our mobile research shows that apps work best when they are designed for repeat users: customers who are already fans of the brand and engage with it on a regular basis. To decide if you need an iPad app, look first at the data: how many people access your full website on an iPad? What do they do there? Are they able to get where they want? Are these people repeat customers and how often do they come to your site?

2. Your iPad app should have a secret weapon compared to your website.

If you decide to have an iPad app, make sure that the app delivers extra value, compared to the website. The app's secret weapon can be superb usability, or just enough usability as to make a repeated task bearable. Look, for instance, at the Epicurious app on the iPad. The app offers essentially the same content as the website, but it's a lot more usable than the website in the kitchen. You can read the recipe without much scrolling and zooming in, or touching the screen — all of these are quite annoying tasks in the kitchen, when your hands are dirty.



Epicurious app. The recipes are displayed in a format easy to read in the kitchen.

Often, the secret weapon needs to be more than just superb usability: maybe the app can offer special discounts or some other feature unavailable on the Web. Examples include flash-sale apps such as Rue La La and Gilt, or auction and classified sites, which

allow regular users to buy products fast; magazine apps that can be downloaded on a plane and read in the absence of an Internet connection; e-commerce sites (e.g., Zappos) that offer free 1-day shipping through the app[5].

Think also if there is a need that you may be able to fulfill with an app, but that your website doesn't already address. For instance, you have a lot of Flash content on your site, and users fail to access it on their iPad. Or you show many maps on the website, and users have a hard time using them on the iPad.

3. Do not make users work more in your iPad app than on your website.

Rarely will users accept to download and use an app if they have to work more for it. For instance, a lot of newspapers offer free access on the Internet, but ask users to register in order to use the app. Our participants were very reluctant to do so.

4. Do not design an iPad app as if it were an iPhone app.

Do not make the mistake to design an iPad app as if you designed an iPhone app: it's not only that the iPad has a bigger screen, but, equally important, the context of use is different. Much noise has been made around the assertion that the iPad is not mobile; the truth is that it is and it isn't. Although people may carry their iPad with them, there is less of the pressure of immediate, local response that users expect from their smartphone.

We often hear users saying that the iPad has replaced their laptop. That does not mean that they suddenly started coding or creating PowerPoint presentations on their iPad, but some of the more complex information-finding tasks are migrating from the laptop to the iPad. Users may attempt to research vacation spots or new products on the iPad, whether they decide to make a purchase on the spot or not. Most users don't even think of doing such a task on the smartphone; instead, they might limit themselves to simple, contextual information needs such as finding the closest hotel if they got stuck in a snow storm.

Killing time is the other major use for smartphones, and that is shared with the iPad. Killing time is often device-driven rather than user-driven: the user may have a very general goal (e.g., read news, browse through a magazine) and is happy to take roughly whatever content the device is offering. However, even for killing time, the uses are slightly different: the time that is usually available on the smartphone is much shorter and more fragmented than the one available on the iPad. On the smartphone, users may look for a quick article to kill the 3 minutes of waiting for the train; once on the train, they may take out the iPad for the hour it takes them to ride home.

As one user put it:

> "I am not in a rush when I use this device."

Making your website iPad-friendly

If you don't need or cannot afford an app — what can you do to make your look decent on the iPad?

[5] At least for one of the authors of this report, the Zappos app did offer free 1-day shipping; that offer was not valid on the website.

First and most importantly, you should test your site. See what the pain points are and then address them. Often fixes will improve the overall usability of your website on the desktop, as well. Some of the more obvious fixes include:

- Getting rid of Flash content
- Creating bigger targets and pad targets so that they tolerate touch better
- Spacing links wherever possible
- Detecting location
- Minimizing the need for typing
- Grouping controls or pieces of information that are related (to avoid having content ignored because it's below the fold)

The Touch Screen and Affordances

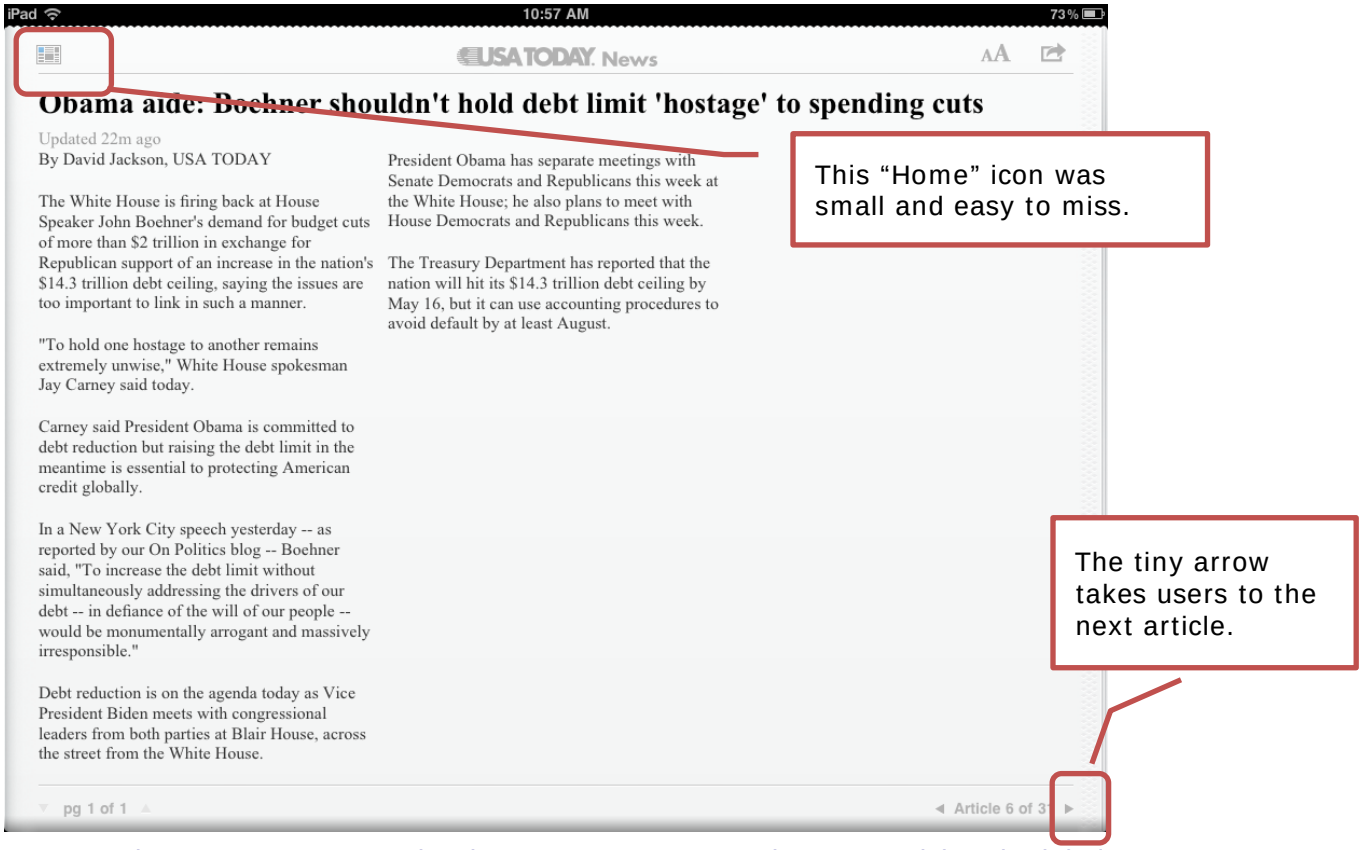
TARGET SIZE

In our first iPad report last year, we deplored the use of small targets in apps. Because the iPad is a touchscreen device, it has the "fat-finger" problem: it's hard to get to small targets. Even though people may be able to eventually hit the desired target (either by being more careful[6] or by zooming in), small targets make them work more.

Research has shown that the best target size for widgets is 1cm x 1cm for touch devices; however, we still see some apps that have tiny targets, far below that recommended limit.

Here's an example from USA Today, which contains some tiny targets on the article page: the home icon in the top left corner (see below), as well as the arrow for navigating to the next article. Granted, the app did allow for an alternative means of navigation to the next article (swiping the page); however, some of our participants, although they were familiar with the app, where not aware of that option and they tried hard to press the small arrow at the bottom of the page.

[6] Fitts' Law from Human–Computer Interaction (HCI) says that the time to reach a target is longer if that target is smaller. When the target is small, users are slowed down because they need to pay extra attention to hitting the right spot. For more information about Fitts' Law and other HCI findings, please see our one-day course *From Science to Design: Applying HCI Principles to Real World Problems*, http://www.nngroup.com/events/tutorials/hci_principles.html

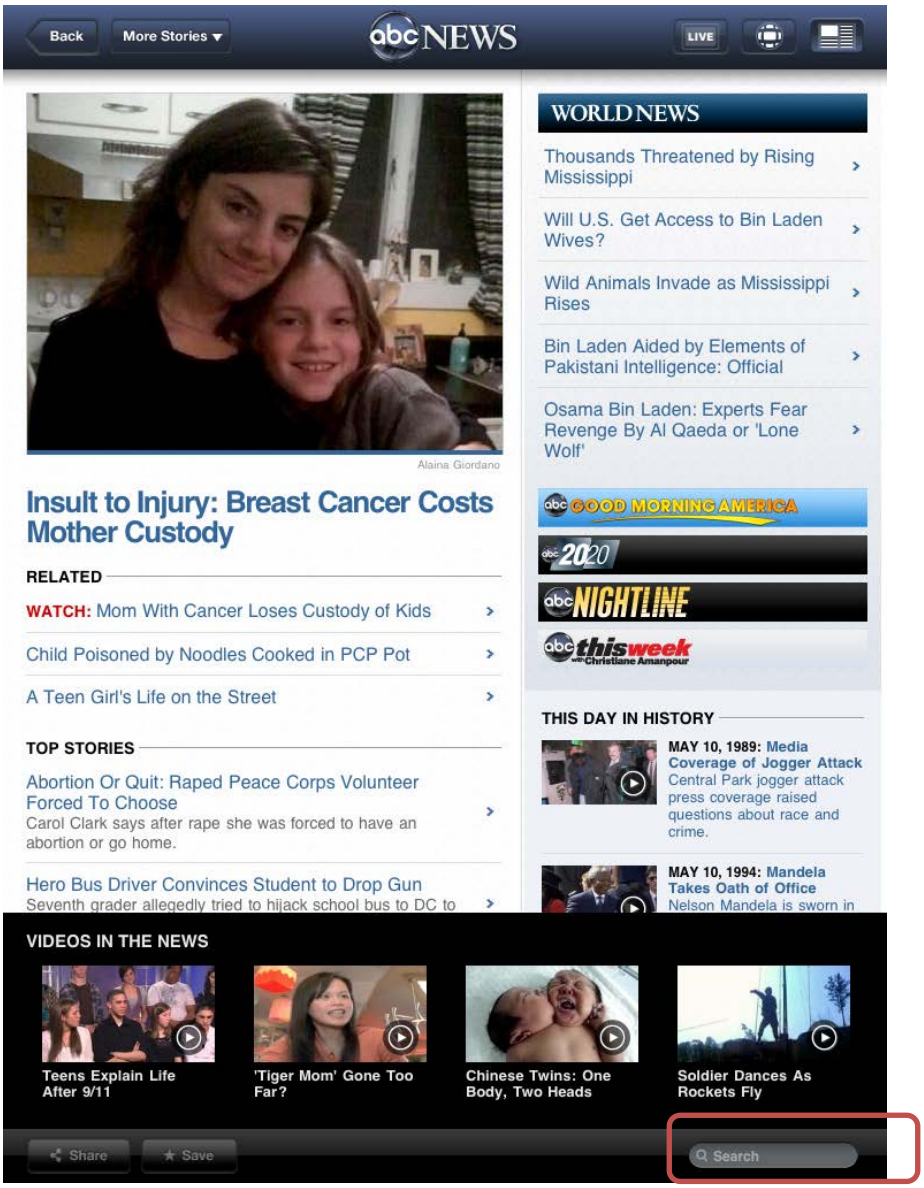


USA Today. Users must tap the tiny arrow to move to the next article. The label ("Article 6 of 31") has poor information scent: it doesn't tell users what the article is about.

Small targets are not only hard to press; sometimes, they are also hard to discover. Here is a participant talking about the "Home" button (top left) on the article page of "USA Today":

> "The only thing that was confusing when I first started using it [the USA Today app] is going back to the homepage. I was hoping for some back button on this. I eventually found this small newspaper icon right here, but that was hard to find."

We applaud ABC News for including a search box in their app. (This was one of our recommendations from last year's report). However, the search box was so tiny that it was hard to select it and to see what was typed in. Discoverability is further reduced by the non-standard positioning of search at the bottom of the page instead of the preferred top-of-page location.



ABC News. The tiny search box makes it hard to select it or to see what's typed in it.

The NASA app was also guilty of targets that were sometimes too small. The home screen of the app was a beautiful image of the solar system. Touching each of the celestial bodies led to a relevant information page. The celestial bodies were (presumably) drawn to scale; unfortunately that meant that some of these targets (Pluto, Mercury, or Moon) were too tiny for most human fingers.

NASA app. Some celestial bodies (Pluto, Moon, Mercury) were too small and could not be selected reliably.

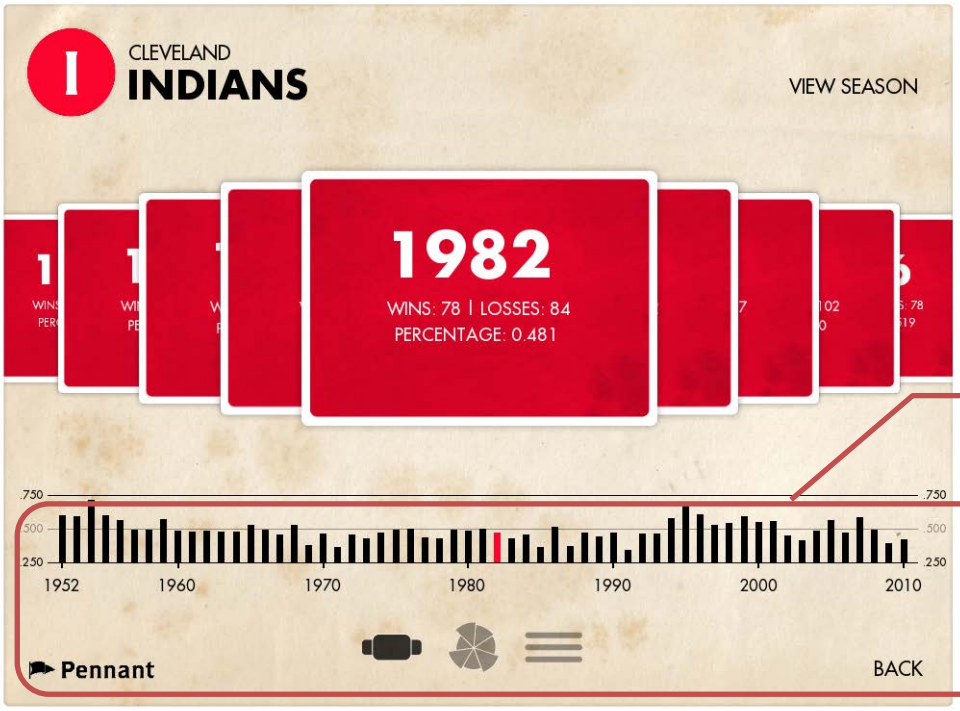
CROWDING TARGETS

Another fat-finger issue that we encountered frequently is placing targets too close to each other.

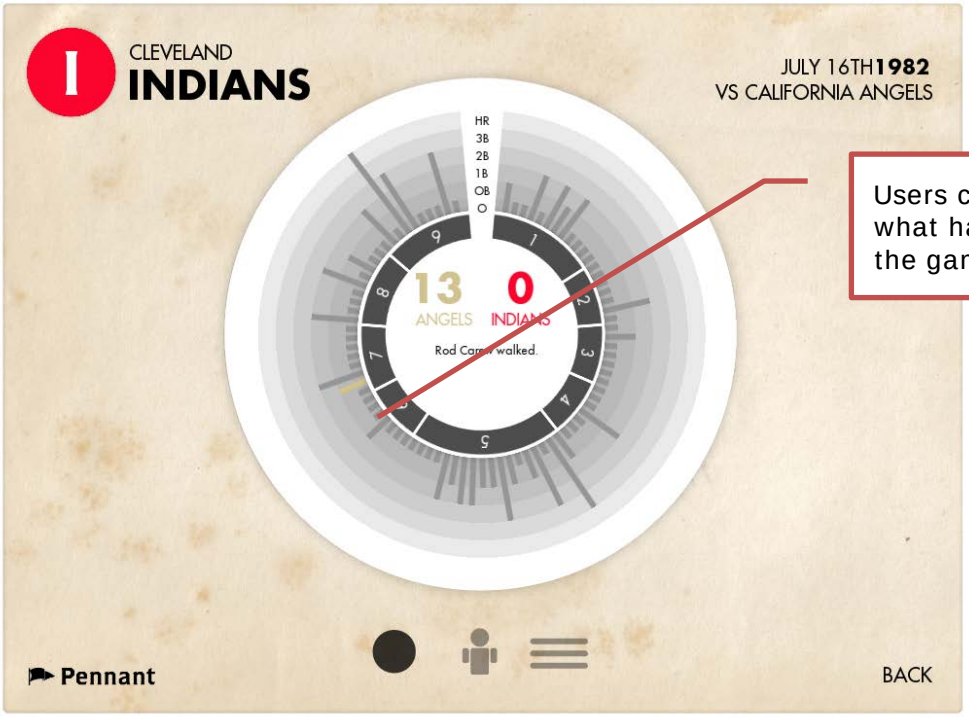
When targets are placed too close to each other, users can easily hit the wrong one.

We can see an example of that in the previous NASA screenshot: the Moon is very close to Mars and Earth, so it's easy to accidentally tap the wrong spot.

Pennant is an impressive app for baseball aficionados, that has some interesting visual features. The app does suffer from grouping targets too close to each other, as the following screenshots indicate.



The timeline is used to navigate to a particular year.



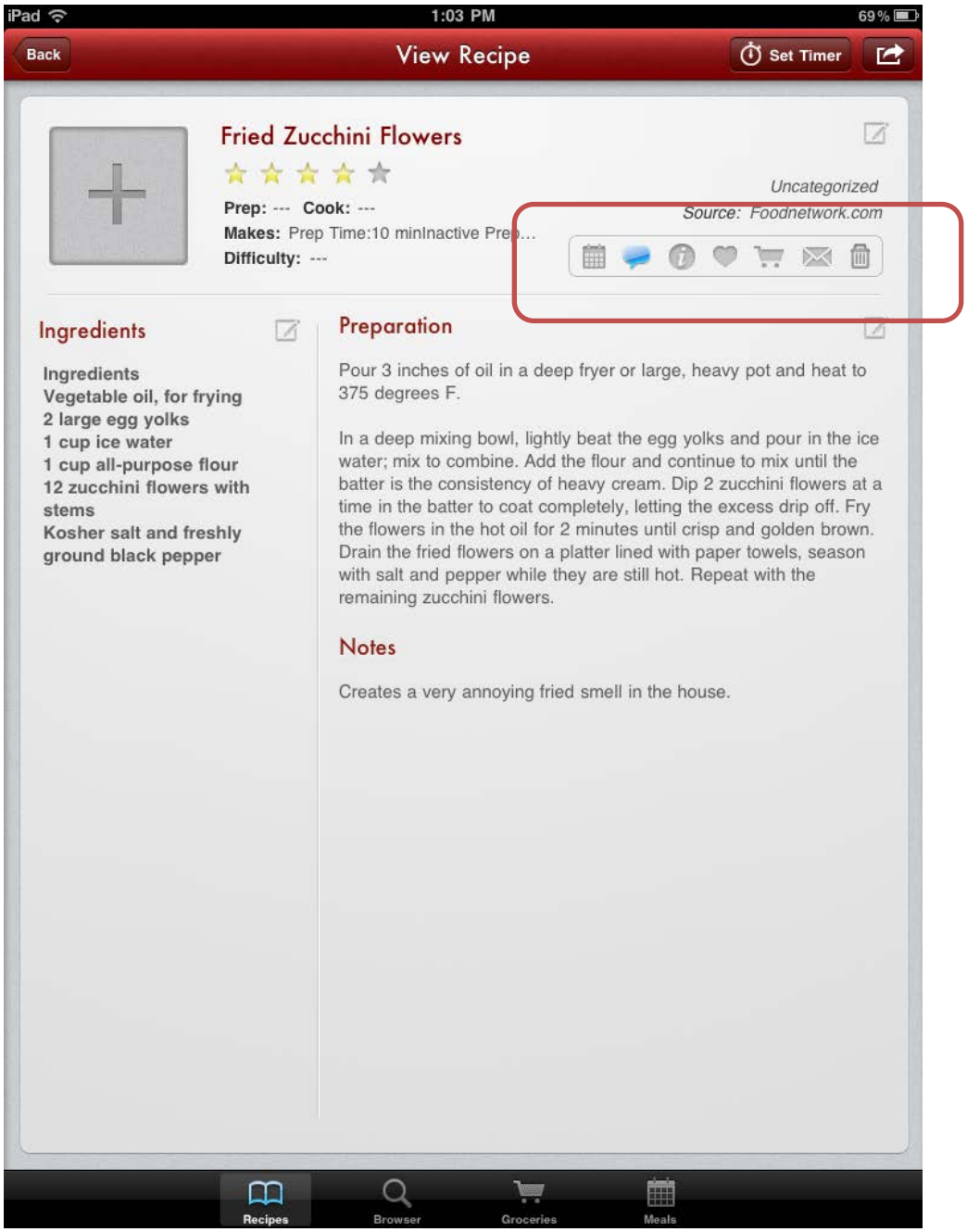
Users can tap on a bar to find out what happened at that moment in the game.

Pennant app. The lines on the various timelines are tappable, but they are too close to each other (and sometimes too small) to select precisely.

In Pennant, users can tap the timeline to select a year and find more info their favorite team's performance for that year. Each bar on the timeline is tappable, and of course, the bars are too close to each other, making it hard to select one particular year. Pennant uses this timeline navigation in other cases, too — for instance, to indicate events of various

levels of importance from a particular game. On a side note, some users found it annoying to have to slide their finger around the circle to find info about the game, and said they would have preferred a more textual synopsis of the game.

Paprika, a recipe-management app, also crowds many icons in a small space. The toolbar on the recipe page contains several icons that are very close to each other.



Paprika. The recipe toolbar is too crowded; although users may guess what the icons stand for, they are too close to one another.

PADDING

One solution that app designers have found for small targets is padding: although the visible part of the target may be small, there is some invisible target space surrounding it, so that if a user hits that space, their tap would still count.

Our research with touch devices indicates that users expect padding in tabular views.

When several items are listed in columns, one on top of another (see the Time example below), users expect to be able to hit anywhere in the row to select the target corresponding to that row. Whenever a design does not fulfill that expectation, it is disconcerting for users.

The table of contents page in the Time magazine app was split into two columns: the column on the right followed the padding convention mentioned above, but the column on the left did not. To navigate to articles from the left column, users had to tap on the red icon next to the headline. This lack of consistency counts as a double usability problem and was particularly confusing to users.

Users expect to be able to tap anywhere in this row to get to the article. This expectation was fulfilled by headlines in the right column.

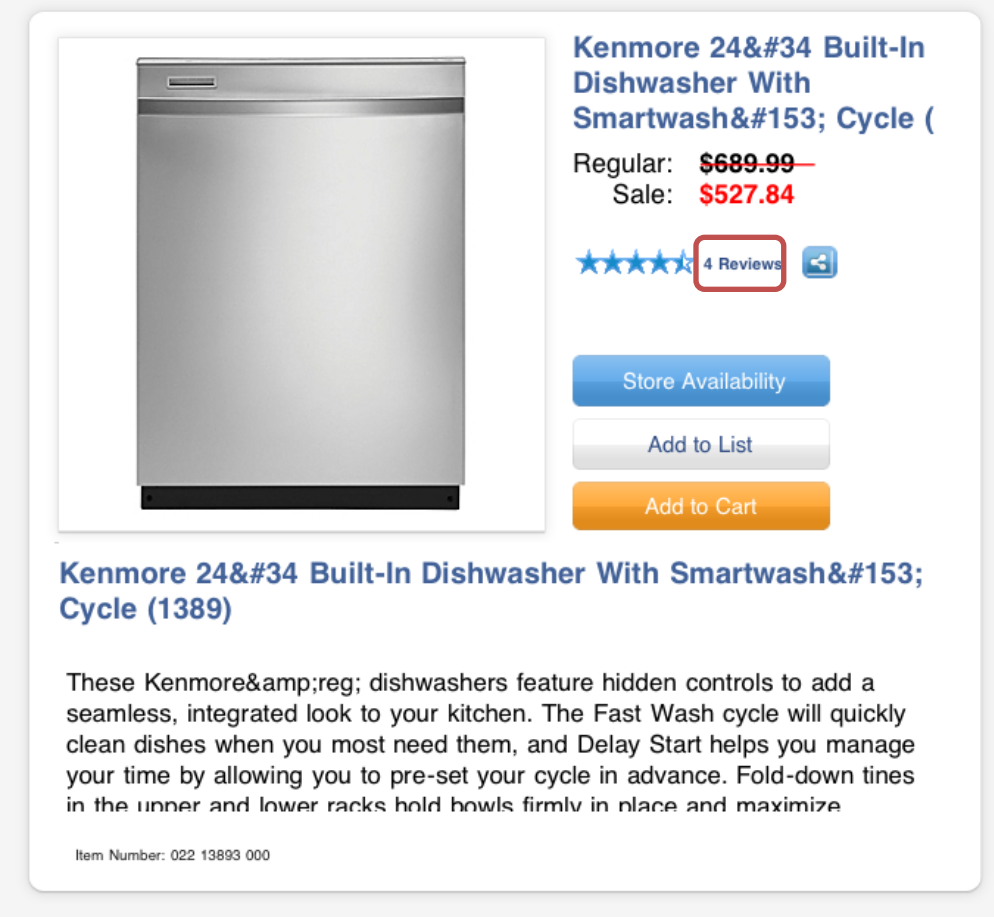
For the headlines on the left, users had to tap on the icon to the left of the headline in order to navigate to the article.

Time Magazine App. The table of contents uses padding inconsistently, only for some of the stories.

AFFORDANCES

Same findings from last year still stand: **users don't know that something is touchable unless it looks so.**

Our participants did not discover the reviews feature in the Sears app because the link to the reviews did not look tappable. While the blue color traditionally indicates a link on the Web, in this instance it was identical with the color of the product name, making users believe that it was just a design choice rather than a tappable element. The link to reviews was also too close to the blue icon.



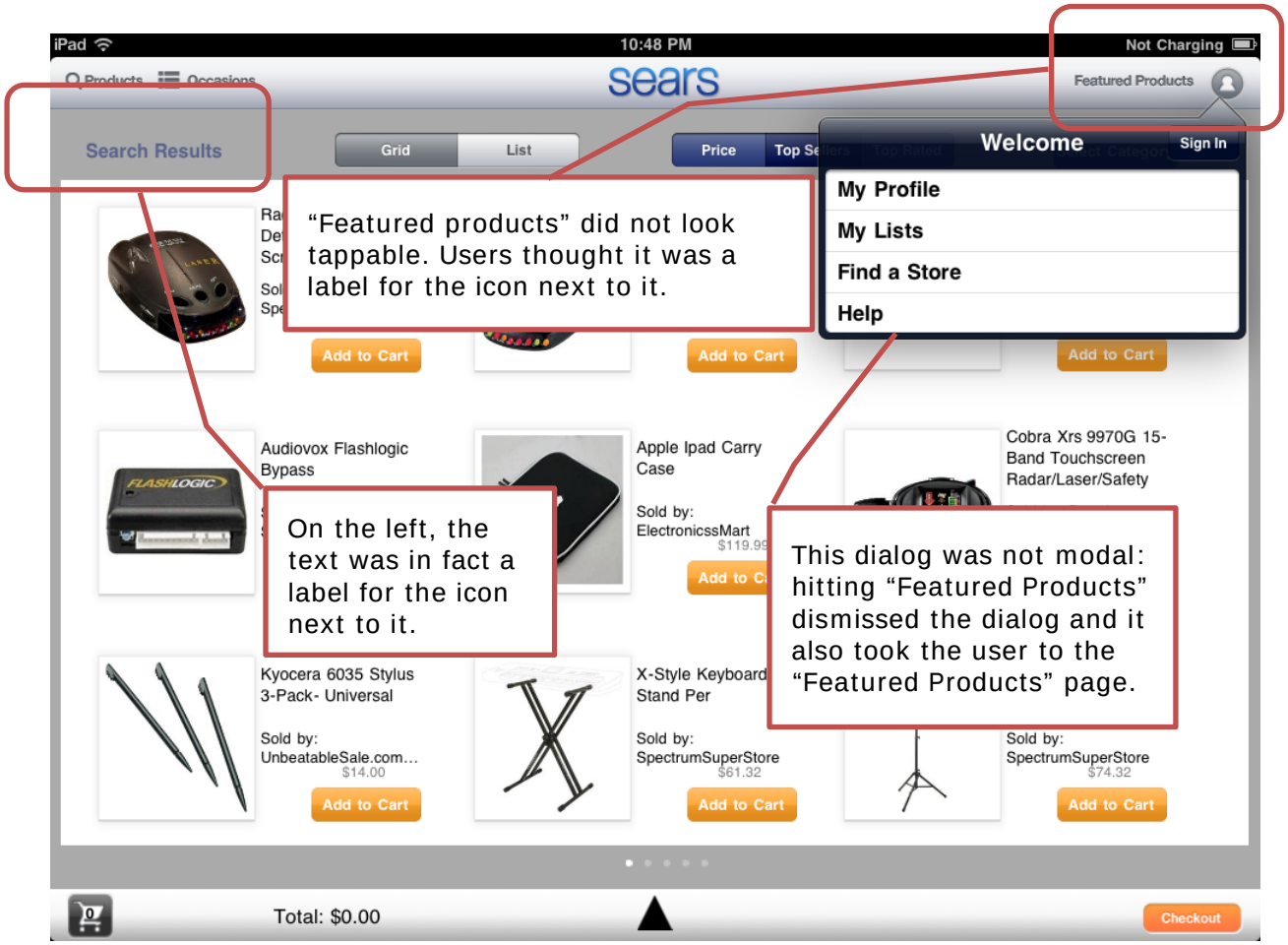
Sears. Users did not discover that they could tap on the word "Reviews" to see the product reviews.

Also in the Sears app, one of our participants did not realize that “Featured products” in the top right corner was a link — it did not look tappable. He thought, instead, that it was a label for the icon next to it (which corresponded, in fact, to an account-related menu).

> “Let me see what ‘Featured products’ is — ok, that has nothing to do with ‘Featured products’, it’s more like a ‘my profile’.”

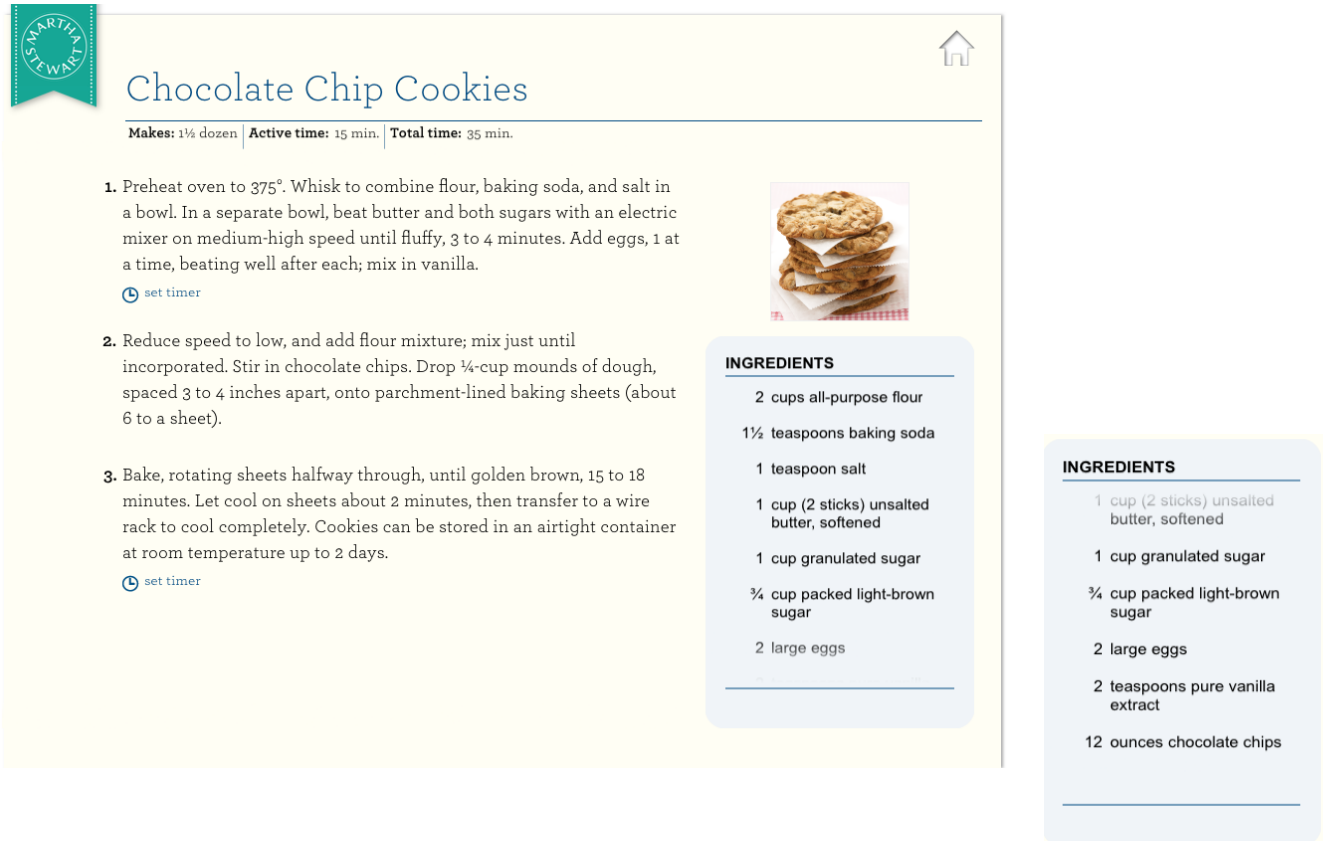
The icon was in fact very close to the “Featured products” link. What’s worse is that, because the profile menu was not a modal dialog[7], when the user tapped “Featured products” to dismiss the menu, he ended up on the “Featured products” page. The application’s behavior seemed completely erratic to our participant.

[7] A modal dialog prevents interaction with the other elements on the screen until the dialog is dismissed. Modal dialogs in iOS are often dismissed by touching any area outside the dialog, a behavior that most users expect.



Sears. The "Featured products" link did not look like a link; users mistook it for an icon label (similar to the labels in the top left corner).

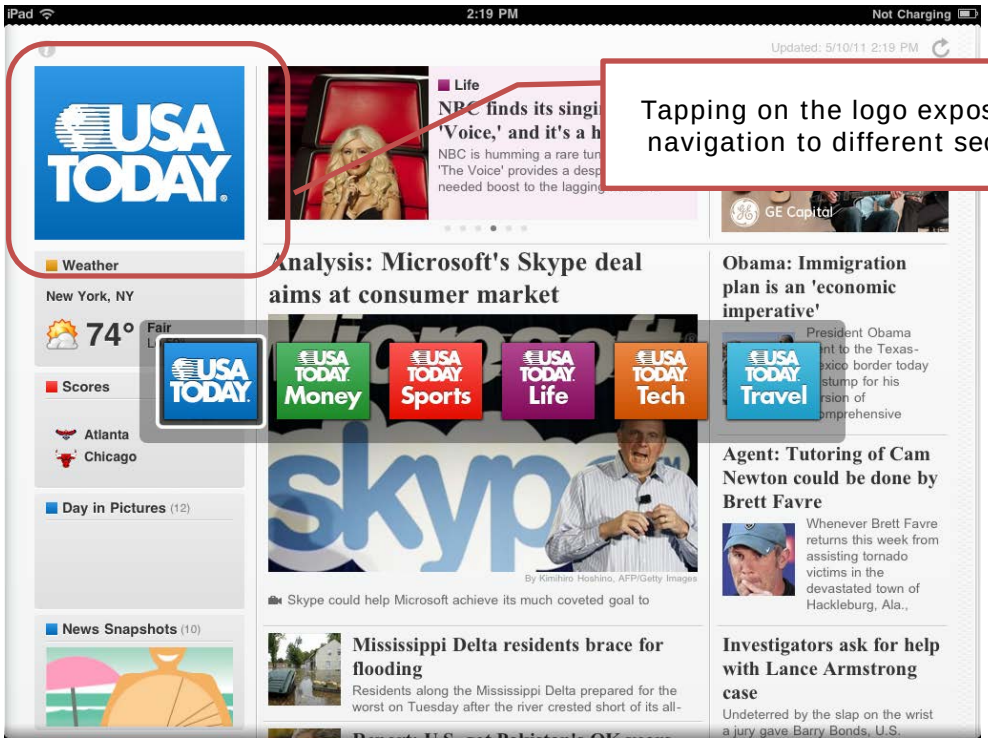
In the Martha Stewart Makes Cookies app, one of our participants noticed that the recipe for chocolate chip cookies did not list chocolate among the ingredients. Was this an oversight on Martha's part? Did she forget to mention chocolate? No. If only the user had noticed the lighter text color for the last ingredient in the box and taken it as a signal to scroll down, they would have discovered the chocolate. Unfortunately, she did not detect that subtle cue.



Martha Stewart Makes Cookies Lite. The ingredients box is scrollable, but there is no affordance for scrolling.

Another example of lack of affordance is the USA Today app. Last year, when we tested this app, we found that users never discovered that they could change the sections by tapping on the logo. This time, we did not test the app anymore. However, some of our participants had it installed on their iPad and showed it to us. Even those who were familiar with the app and were using it fairly often were not always familiar with this tapping-on-the-logo feature. And some of those who had discovered the navigation hidden under the logo still remembered the painful experience of finding it:

> "Going out to different categories was at first hard to find out; originally, I pressed the refresh button right here [top right corner]. [...]Then I found the little *i* [top left corner] — that wasn't it either, and then I just started tapping and this [the sections popover] came out... Ok, but if somehow they would have told you how to go back to the sections, it would have been helpful."



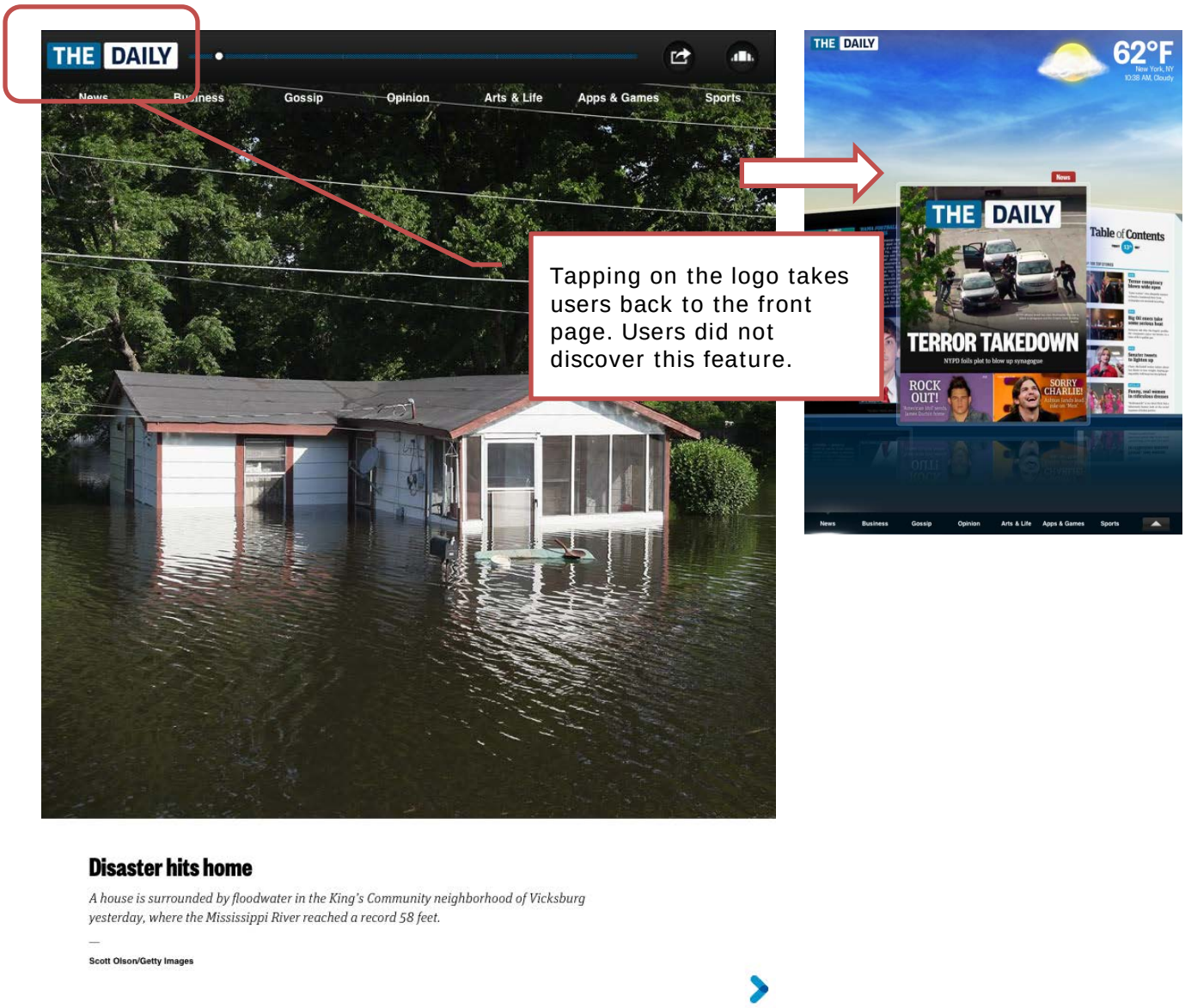
USA Today (at the time of the study). The navigation is hidden under the logo and hard to discover.

The problem with USA Today is twofold: (1) the logo looks flat (and not touchable), and (2) the label on the logo has no connection with the current task (finding the news sections).

As we were writing this report, USA Today came out with an update: an explicit button with the label “Sections” has been placed above the logo in the new version. We haven’t tested this new design, but it can’t help being better than the old one which doesn’t work — as we’ve known for a full year since the data from our first study.

The updated version of USA Today shows the word "Sections" above the logo.

Another app that uses the logo for navigation is The Daily: tapping on the logo takes users back to the front page in the carousel view. In our testing, most users did not discover that feature. The only exception came from a user who was so persistent, that he swiped back to the first page and read the instructions to figure out how to navigate quickly to the table of contents. (He was still not satisfied, but he figured out that from the carousel he could get to the table of contents with one more tap).



The Daily also hides a navigation option under the logo.

What's the lesson learned from these examples?

Build affordances by making buttons look tappable and relevant to the task they accomplish. This means choosing the right icons and labels for those buttons or action links.

INPUT AND REGISTRATION

Although typing on the iPad is easier than typing on a touch phone, most people still don't enjoy doing it. The main reason is that typing on the iPad is pretty much a hunt-and-peck endeavor: users must split their visual attention between finding the keys on the screen and reading what they typed; moreover, the keys offer no tactile feedback.

In our testing, typing often spoiled the fun — we often heard comments such as:

> "I type a lot faster on my computer."

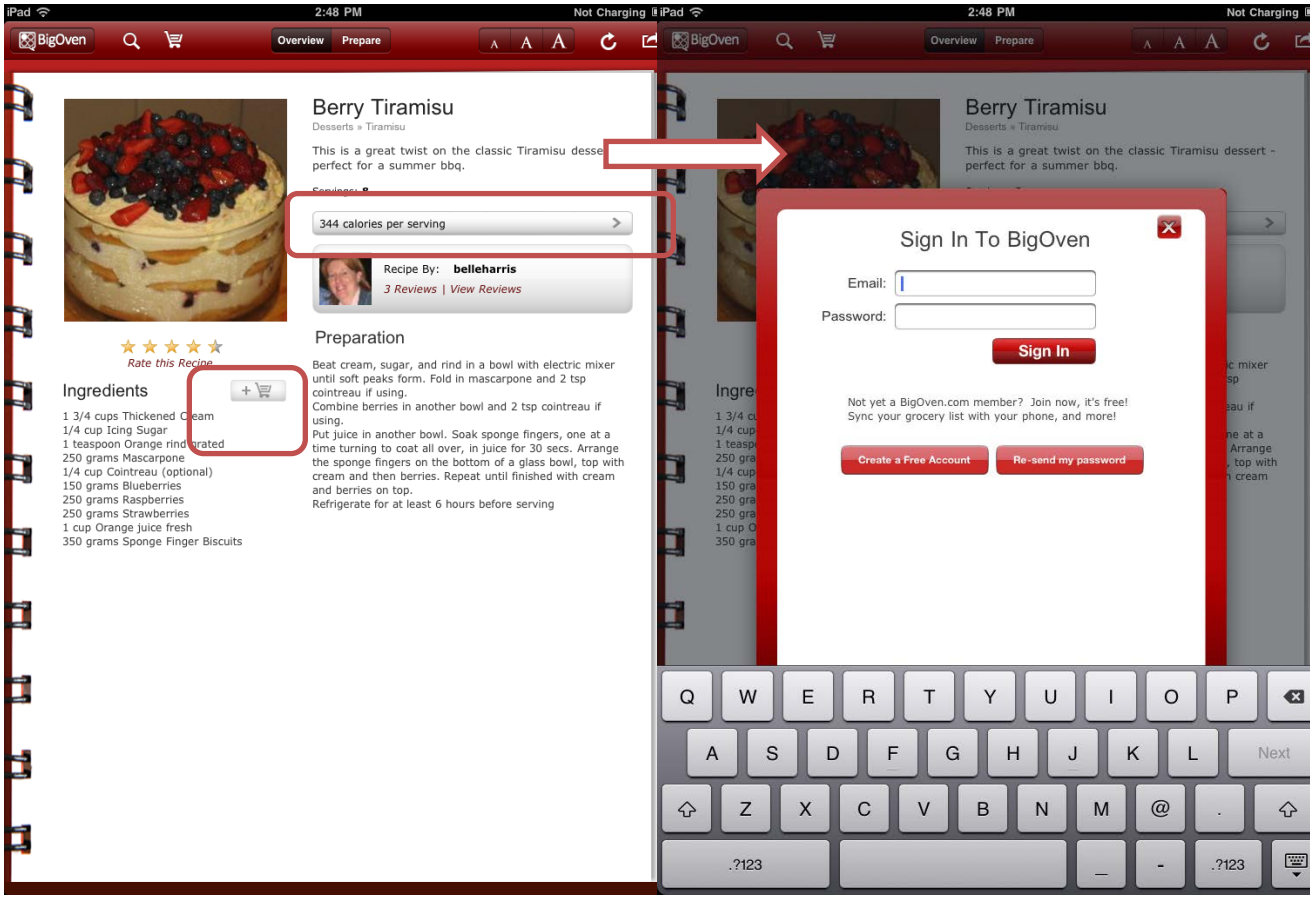
> "I am not good at typing on this."

Our participants were more tolerant of typing when they perceived the need for it — for instance, when they were completing a purchase and had to type in their information. They didn't like the typing when they had to create an account for the purpose of accessing information (like in the case of Washington Post).

Big Oven upset one of our participants because, in order to see the caloric information for a recipe, it asked him to create an account. The user went ahead and created it, but after the account was created and he wanted to check the calories, he was denied access and told that he needed to upgrade to the paid version in order to get that information:

> "Oh, that is annoying! I don't like that! So even if you sign in, you have to pay 16 bucks a year… that is bull!"

We advise against these kinds of tactics to get access to users' emails. In this case, the user's effort to create an account was wasted and he felt tricked. Users should be told in advance what they need to do in order to get access to a feature (in this case, sign up AND upgrade).



Big Oven. Users were asked to sign in to get access to the detailed caloric content of a recipe or to add the recipe ingredients to a shopping list. Once they signed in, they discovered that they also needed to upgrade to the paid version of the app (see below).

One of our participants was annoyed with the QVC app because, after he typed in his address several times, the address was still not recognized. There was no explanation of what in the address caused the problem, and no attempt to suggest a fix.

To minimize user input on the iPad:

1. **Compute information for the users.**

   For instance, ask only for the zipcode and calculate state and town; possibly offer a list of towns if there are more under the same zipcode.

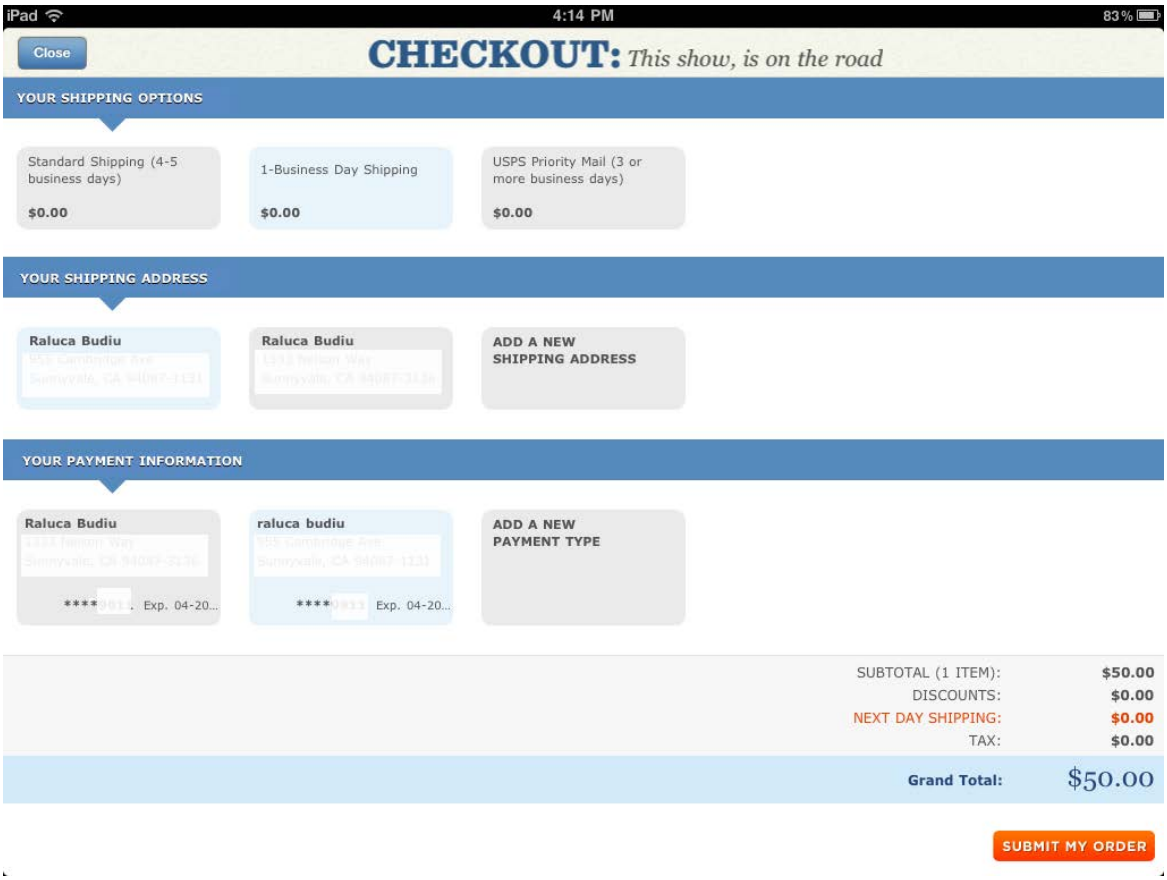
2. **Be tolerant of typos and offer corrections; don't require users to type in complete information.**

   For example, accept "123 Main" instead of "123 Main St."

3. **Save history and allow users to select previously typed info.**

4. **Use defaults that make sense for the user.**

Zappos and QVC do a good job of saving information in the app; once the user is logged in, they can easily go through the process of ordering without entering any extra information.



Zappos. The app saves shipping addresses and payment information from previous sessions.

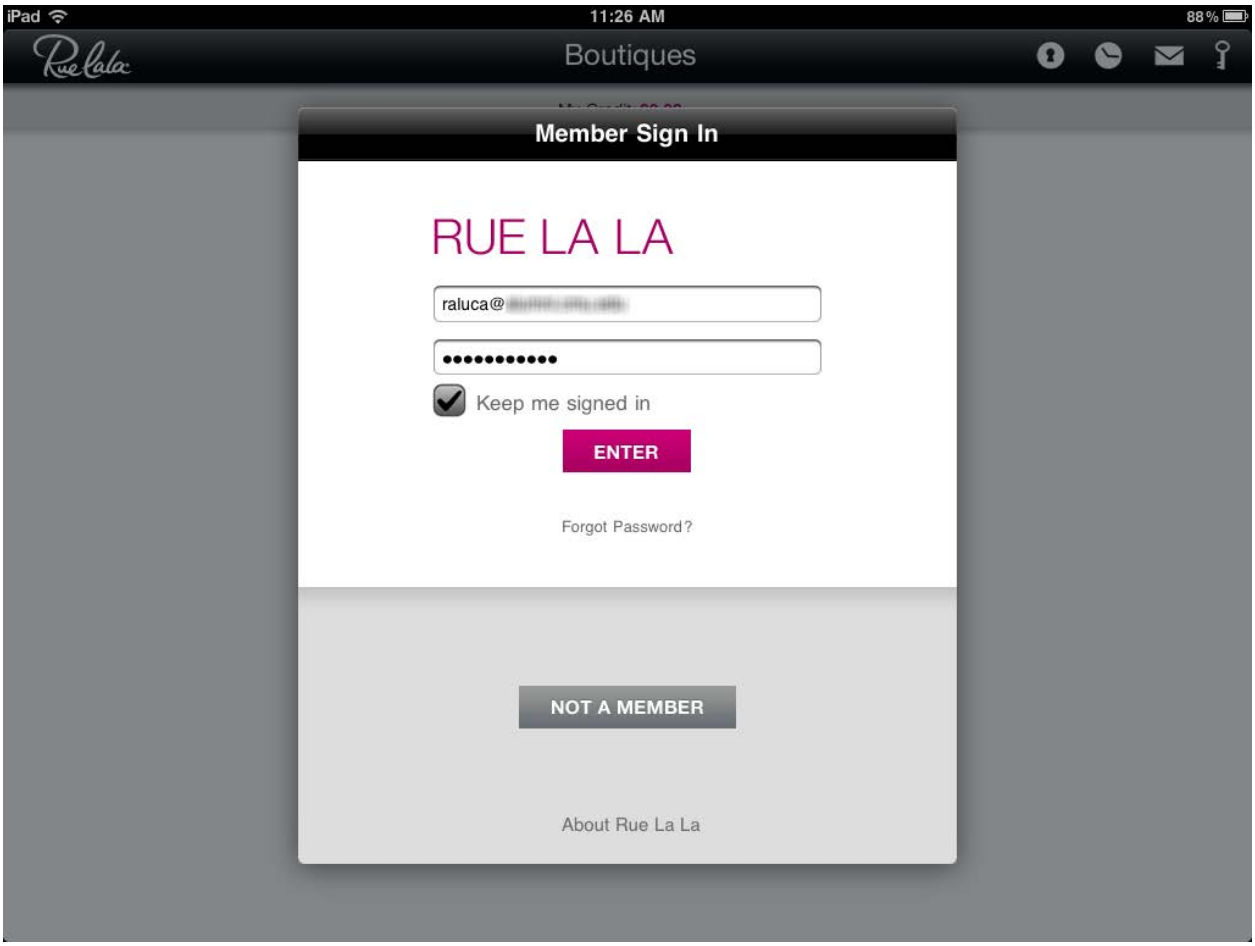
Should apps save log-in info or should they require users to log in each time?

5. **If the app does not store any information that is sensitive (e.g., credit card), then the user should definitely be kept logged in.**

The option to log out should be presented clearly on the screen, in case a different user is accessing the app.

6. **If the app does store credit card info, the app should allow the users to decide if they want to be kept logged in or they want to log in again each time they use the app.**

An example of app that does that is the flash-sale app Rue La La.



Rue La La allows users to decide whether they want to be kept signed in.

Ideally, when the user opts to be kept logged in, they should get a message informing them of the possible risks.

The Big Screen

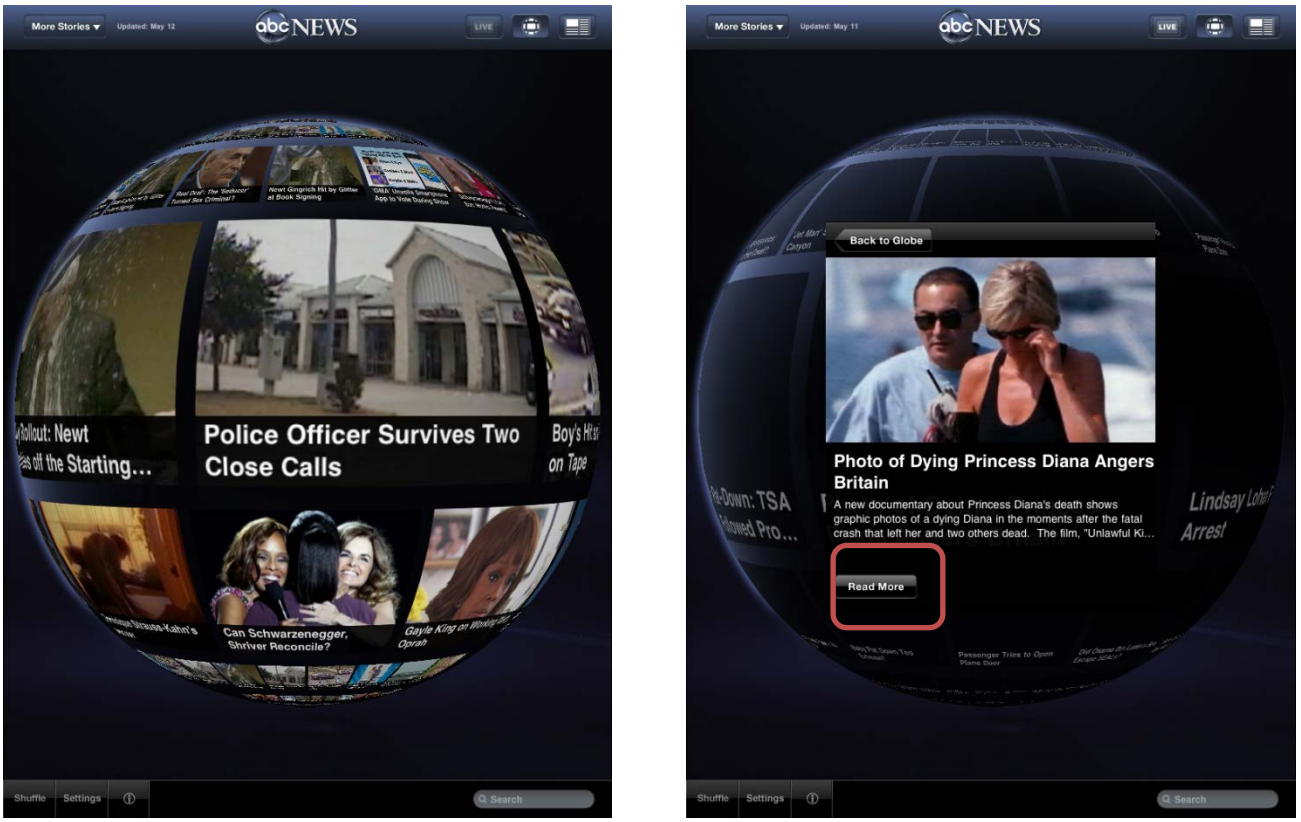
Many apps use the (relatively) big iPad screen inefficiently: the screen contains little information, and users have to take extra actions to get to the content.

An example is the ABC News app, which displays a big globe on the homepage. The story titles can be read one at a time (the others are distorted). If a story gets selected, the app shows the first lines of the story; to read it, you need to tap one more button. Compare that with the list view in the same app: once you tapped a story headline, the article view appears immediately.

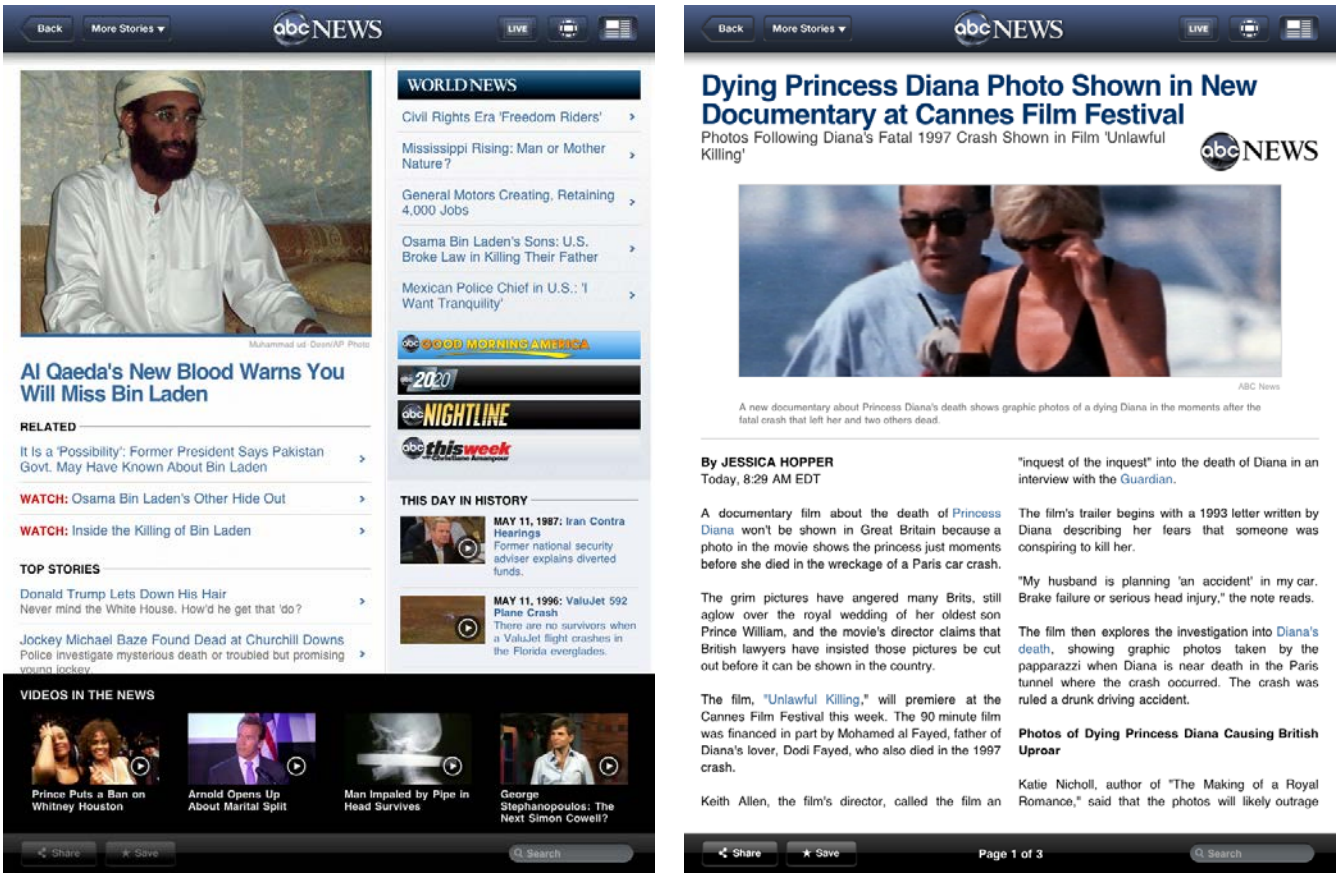
Many of our participants were at first excited about the unusual presentation in the ABC News app, but, after a while, they got bored. Some felt that they could read the news better in the alternative list view:

> "I like this [the globe], but I prefer the standard view. It's just easier to read, it's flat, the other one is kind of cool to look at, but I like the clean lines [of the standard view], it's very easy to understand, it's very simple."

> "I don't like the globe; I like the grid better - less stressful on the eye."



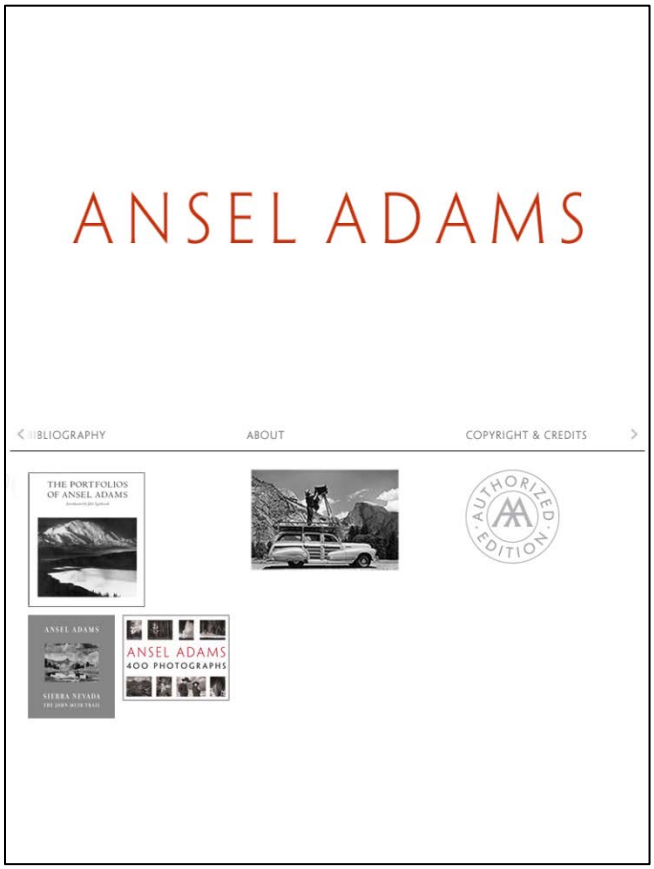
ABC News. The globe view allowed users to read one story headline at the time. To read a story, they needed to tap on it and then tap on the "Read more" button in the popover.



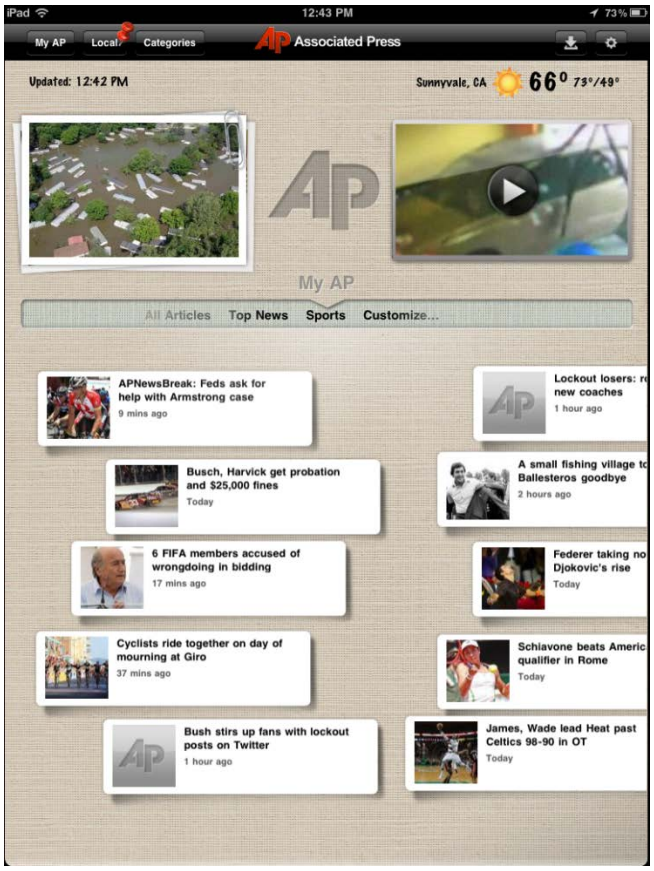
ABC News. The list view made more efficient use of space. Tapping on any headline leads directly to the corresponding article.

The homepage of the Ansel Adams app has a lot of white space. Users can see only a few of the navigation options available to them at a time. And the labels for the navigation options are in a small font that is hard to read (granted, the low contrast between the text and the background also does not help).

Similarly, the AP News app shows the different headlines in small label-like boxes, placed irregularly on a canvas. Some of the headlines are only half-shown, and there is a lot of wasted space.



(a)



(b)

(a) Ansel Adams app. The homepage shows just a few navigation choices at the time, opting instead for a lot of white space.

(b) AP News app. The headlines are placed in white boxes spread randomly on a canvas.

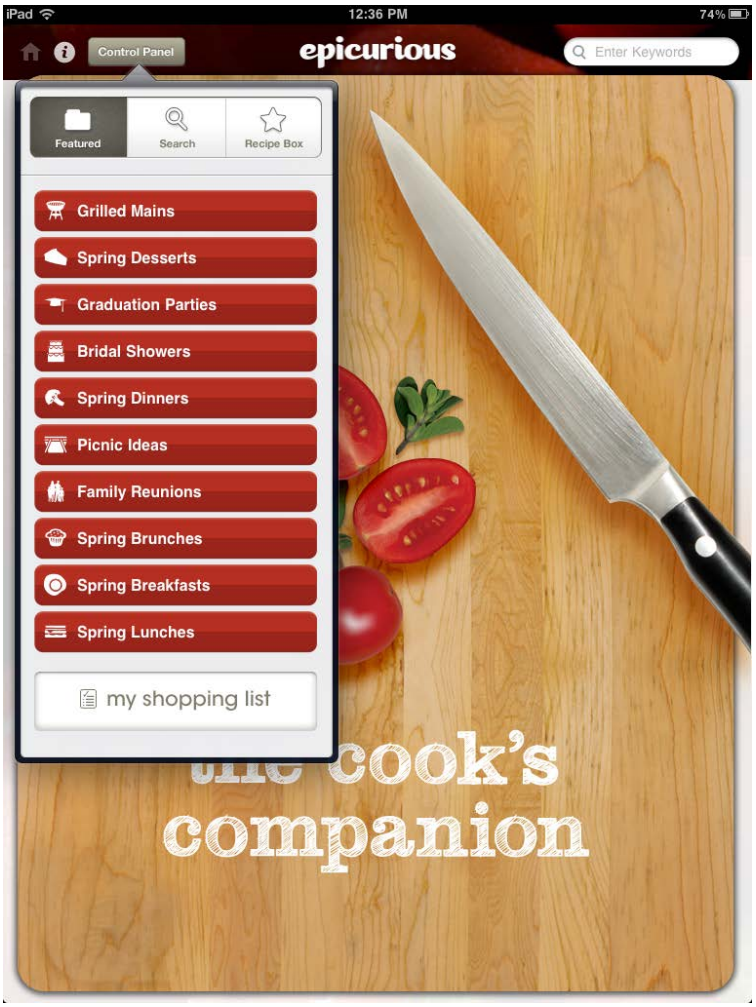
The Weather Channel app manages to use an entire screen to display very little information. Most users have familiar locations as defaults; a map of the location is unnecessary. A more detailed weather forecast would be more appropriate; right now, users must tap a few more times to get, for instance, tomorrow's weather.

Weather Channel shows little useful information on the first screen.

POPOVERS FOR DISPLAYING INFORMATION

Popovers are frequent culprits for underutilizing the space. Too often we see relevant content crammed in a small popover window, while all the other space underneath remains unused.

Below is an example from Epicurious. Users have to scroll through the options in the control panel, while the ample space underneath is taken by a (beautiful) picture. It would have been better to lay out all the different navigation choices in a table view and show them on the whole screen.



Epicurious. The Control Panel is packed in a small popover, while the background screen is not used.

Another example comes from NASA. One of the icons in the top navigation bar[8] displays a popover with information about the different space missions. Each space mission in the popover comes with a big picture, and users have to scroll in the small window to find a mission of interest. The popover does come with an alphabetic selector on the right; however, none of our participants noticed or used it, possibly because of the low contrast of the different letters. Even with the selectors, the popover is just too small for the interaction, and there are no benefits from having the picture of the solar system in the background.

[8] Several participants commented that they had no idea what the icons meant.

NASA. The popover for the space missions contained a long list of missions, through which users had to scroll.

Before using a popover to display information, ask yourself:

- **How much information do I need to display?**
    - If it's just a few lines and the user does not need to scroll to see it, then it's ok to use a popover.
    - If it's a lot of information, then it's better to use a table view or some other type of view that is suitable for the content.

- **Does the user need to see any info on the current screen in order to use the popover?**
    - If no, you are probably better off using a different view.
    - If yes, will the popover actually block that information or not? If not, then it's ok to use a popover.

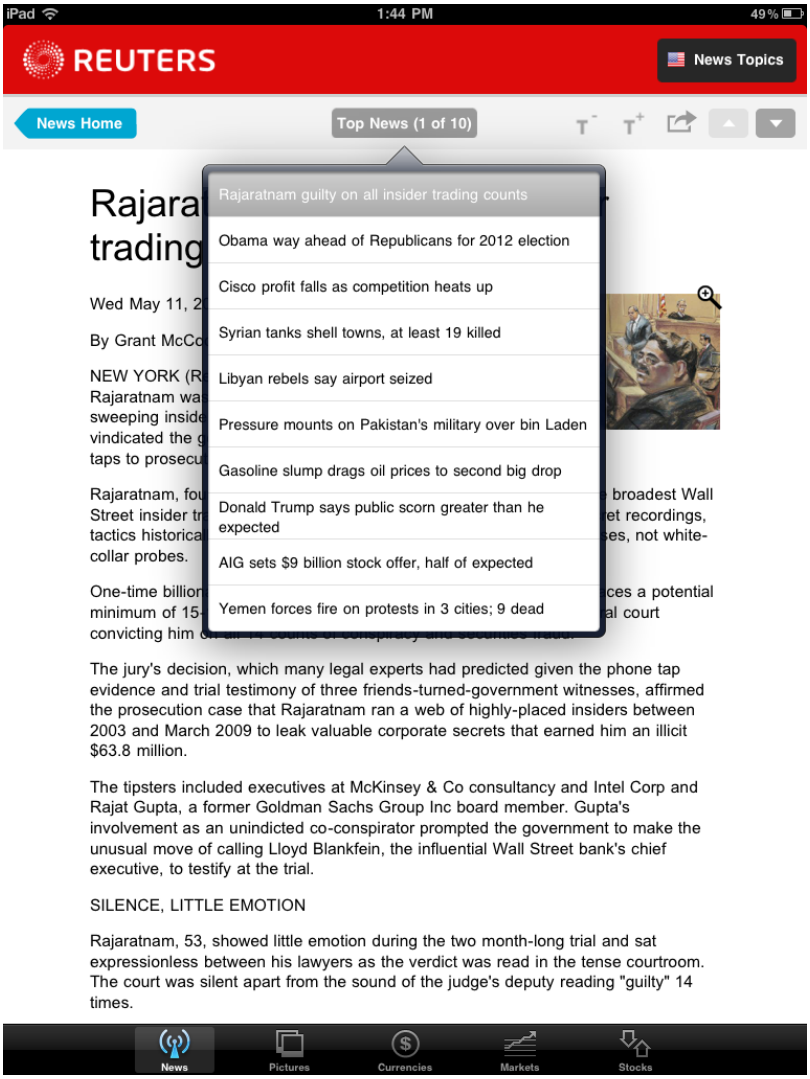
- **Are the items in the popover visible in enough detail so that the user can make a decision?**
    - If some of the items in the popover contain thumbnails, you're probably better off using a regular table view on a separate page.
    - If the text font needs to be small so that items fit into the popover, the popover is not appropriate.

A lot of the times, news applications use popovers (or split-views in landscape mode) to save users the extra step of going back to a hub page and selecting a new story. That

model assumes that users are going to spend very little time in the popover and most time reading articles.

From our testing of news and magazine apps, it turns out that most users read just a few articles per session, and spend most of their time scanning headlines and summaries for something of interest. That's why it's important to support the browsing activity better by giving it extra space, especially if there are a lot of news stories to go through.

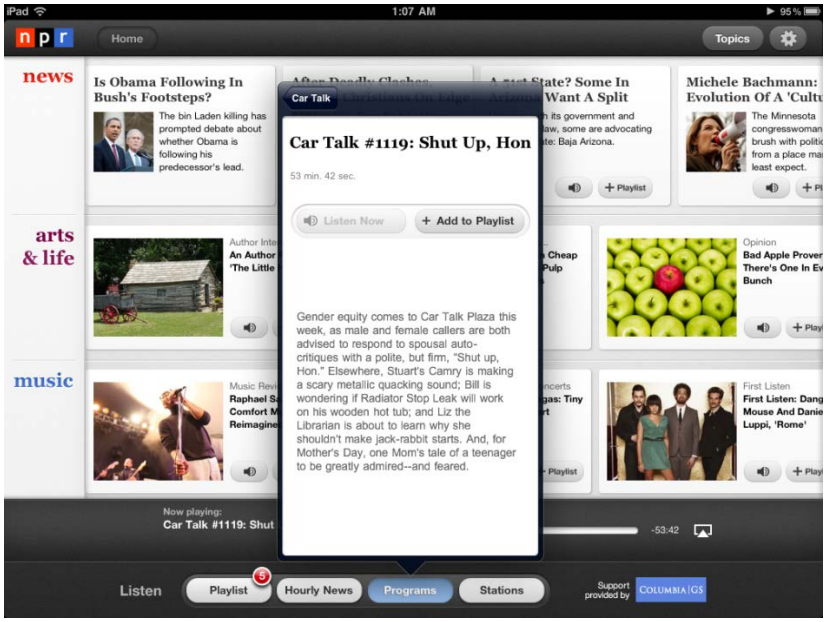
Reuters News Pro app does pass some of our criteria for using a popover, but unfortunately not all. The app displays the news headlines in a popover, but the users almost never have to scroll because the app always displays only 10 stories. Unfortunately the font of the headlines in the popover is on the small side, and browsing could have been supported even better if the headlines had summaries underneath. (In that case, in order to avoid scrolling, they probably would have had to be presented on a separate page).



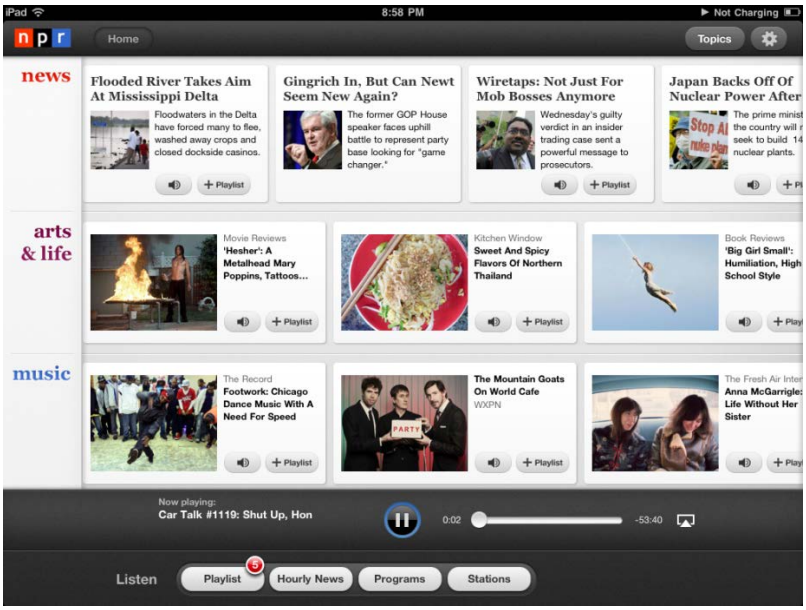
Reuters uses a popover that does not require users to scroll. However, the font is in the popover is small and can be hard to read.

The NPR app commits another type of popover sin: the popover is persistent after the user has chosen an action and it blocks information important for the task. To listen to an NPR program, the user needs to navigate through several popovers until one of them contains the button "Listen now". When that button is pressed, the popover does not disappear, but

the audio starts playing. If the users need to stop the audio quickly, they have to dismiss the popover first, and then tap on the pause button underneath the popover. (An equally severe problem with the NPR app is that the audio starts playing audibly when the iPad volume button is off).



(a)



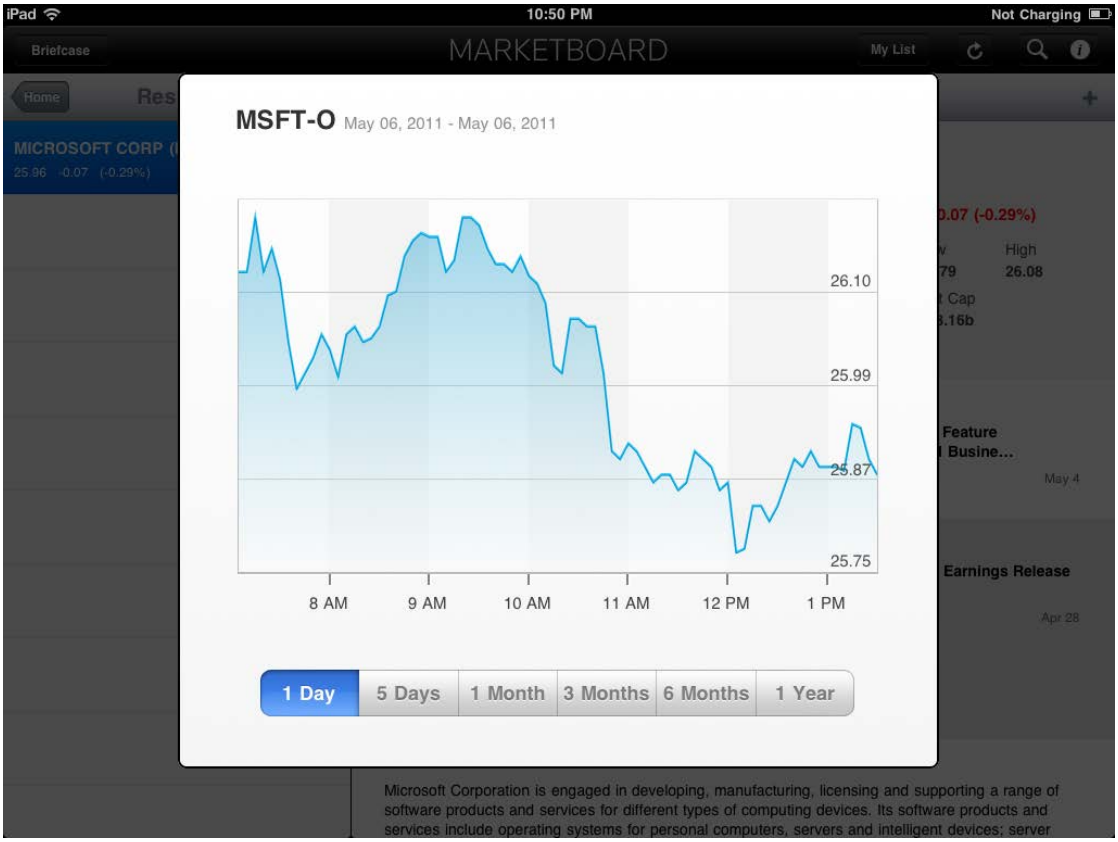
(b)

NPR. The popover in (a) blocks the pause button in (b). To stop the audio, the user needs to first dismiss the popover.

SMALL MODAL VIEWS

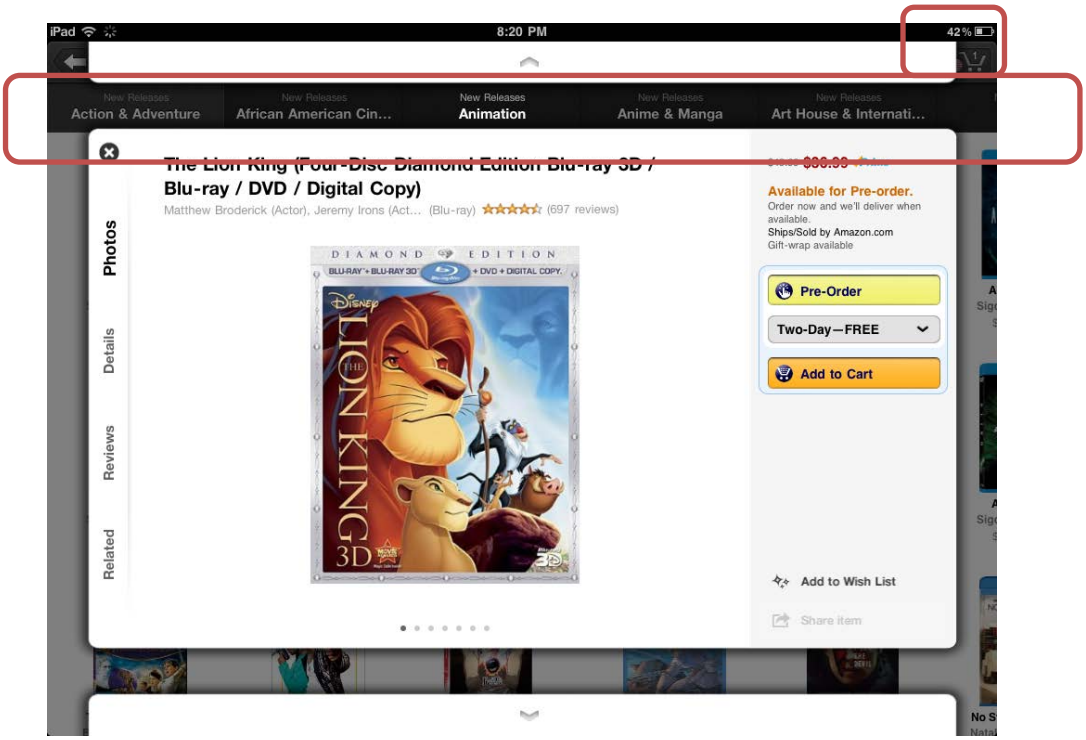
Sometimes a smaller-than-screen modal view is used to display an article, a product, or some other type of information. Again, **the question to ask when tempted to use such a view is whether there is enough space to display all the needed information.**

Reuters Marketboard and Sears use a small modal view to display charts and product pages, respectively. In Marketboard's case, although one perhaps could argue that a bigger graph may have offered more detail, the chart is clear enough and users can easily interact with it. In Sears' case, the application could definitely benefit from a larger product page: the description does not fit the dialog, and there is more product information that users may have found useful that is absent from the app.



Marketboard. Stock charts are showed in a smaller-than screen modal view. The chart is clear and users can easily interact with it.

Sears. The modal view does not fit the product description entirely.

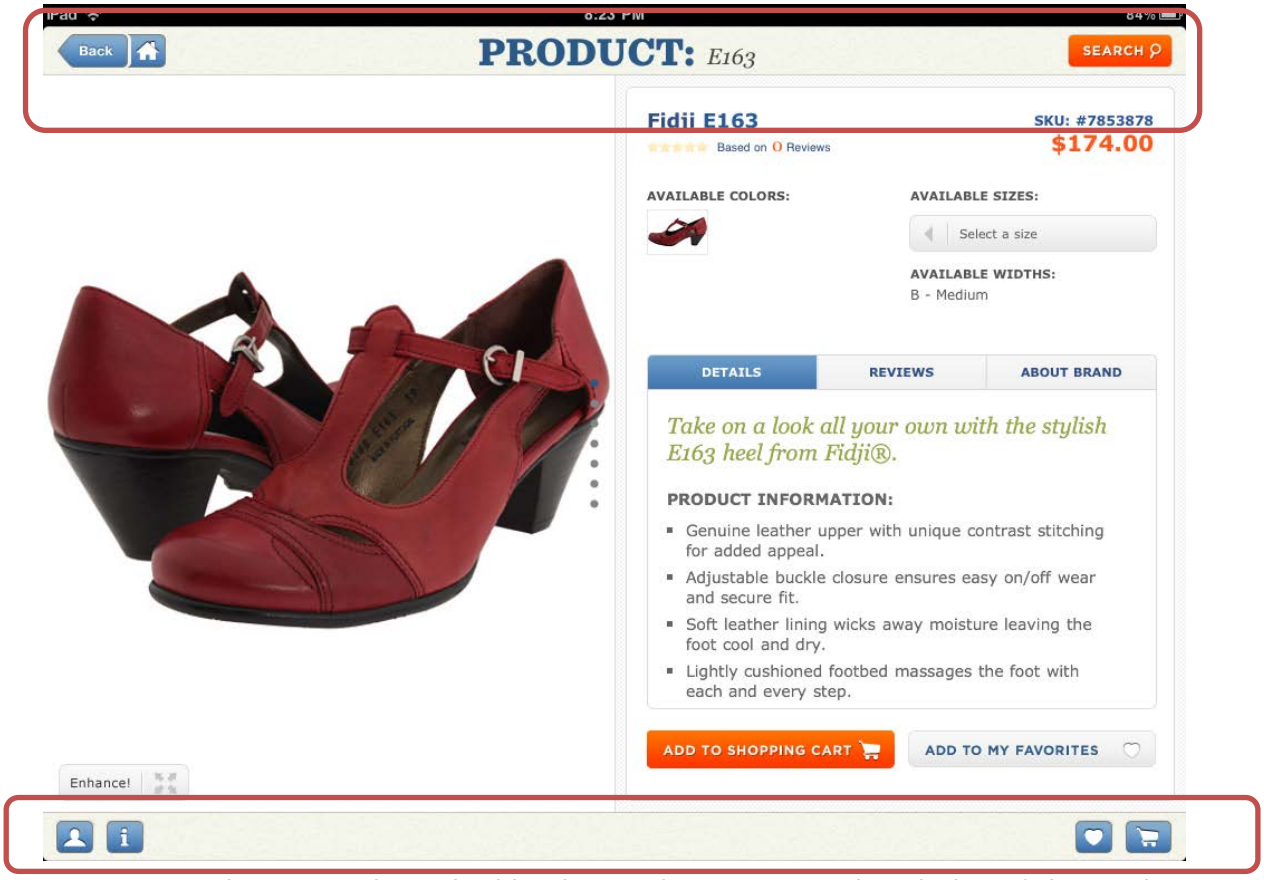


Amazon Windowshop. The product info is displayed in a modal view; the different product categories are still visible in the background, with the current category highlighted. The shopping cart is also visible in the top right corner.

Sears, Amazon Windowshop (which also uses popovers for product pages), and other e-commerce apps that use modal views for product info may be motivated by the fact that part of the interface (such as navigation or shopping cart) are often still visible in the background and that those cues might keep users oriented within the app.

Indeed, when Amazon Windowshop displays the product popover, it also shows the different product categories at the top of the page (in background), with the current category highlighted. However, for both Sears and Amazon Windowshop, users in our study were far from satisfied by the amount of product information or by the way this information was presented. In the case of Windowshop, for instance, users had to select a different product tab to see a description of the object, and, in several cases, they just taped on the picture hoping to see more information about the object.

We think the solution chosen by Zappos or QVC is preferable. They designed a separate product page, and the image was big and shown next to the product description. They also incorporated navigation items such as a search box or tab bar in the product page.



Zappos product page showed a big picture close to a text description of the product, and included several navigation buttons (Home, Search, Cart, etc.).

QVC. Product info is on a separate page that also contains several navigation options.

In conclusion:

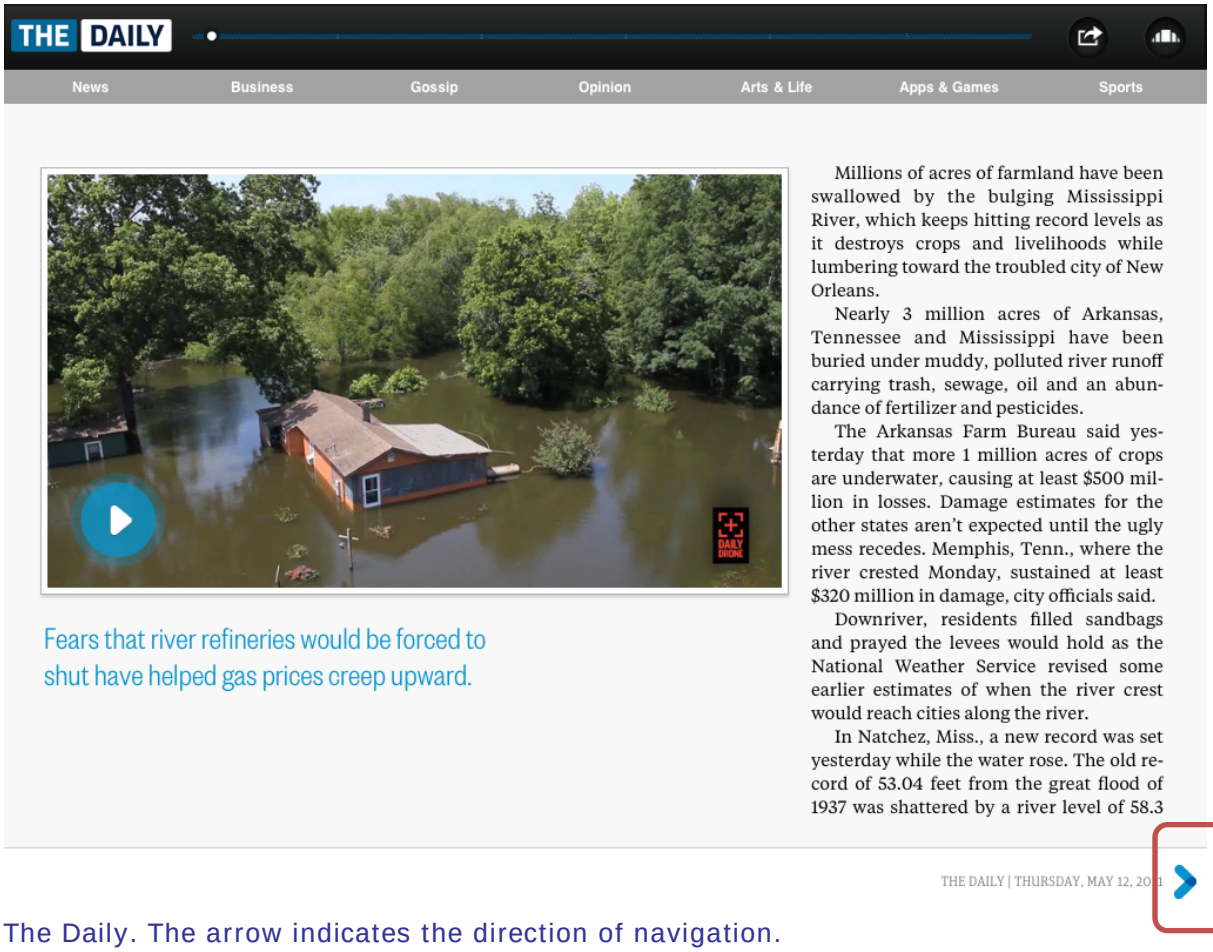
If you have a lot of content (such as product information) to display, use a separate page rather than a modal view.

Gestures

SWIPING TO TURN THE PAGE

Some apps (such as Bing) use the swipe gesture to navigate forward and backward. This gesture has relatively low discoverability, although users are more likely to try it in certain kinds of apps (especially magazines) that have a strong resemblance to physical books. Bing displays tips to first-time users to make sure that they actually discover this gesture.

Other apps that use the swipe gesture give users cues such as arrows to indicate the direction of navigation. The Daily and Wired are two examples below. Users loved these hints and commented that they helped.



The Daily. The arrow indicates the direction of navigation.

A FEW YEARS AGO, Bill James was in a Boston hotel room, relaxing with a book about one of the city's most accomplished yet least admired sons: the Boston Strangler. There are numerous accounts of the killer's grisly 1960s spree—which left at least 14 women dead—and James has read a lot of them, possibly *all* of them. But this particular book stood out, mostly because the author's research was sloppy. James kept finding mistakes. In one case, even the location of one of the murders was wrong. "The guy really irritated me," James says.

James lives in Lawrence, Kansas, but he spends quite a bit of time in Boston, where he's worked for the Red Sox since 2002. Technically, he's the team's senior adviser of baseball operations, using his deep statistical knowledge of the game to help the Sox develop strategy and decide which players to sign. But it would be a mistake to think of James as a mere number cruncher. What he really does is study baseball—its history, its dynamics, its laws—and ask questions: What's the best way to use a relief pitcher? How important is a bunt? Usually, these are questions that have been put forth numerous times before and seemingly resolved. But James keeps asking them anyway. In the process, he has become one of the most celebrated analysts in the sport's history, with more than a dozen books to his name, many of them considered indispensable.

In addition to wondering about slugging percentages and pitching records, though, James has long been asking questions like: Why do some crimes become more famous than others? How reliable are eyewitness descriptions? Was the real Boston Strangler caught? Which is why his latest compendium of knowledge isn't about baseball; it's about murder. Called *Popular Crime*, it's an omnibus of serial killers, kidnappers, assassins, and the occasional terrorist. Most of James' research is drawn from his mammoth library of true-crime books. And after reading extensively about the Boston Strangler, he started to second-guess the supposed experts—the cops, the lawyers, the authors.

What if, James wondered, the police had arrested the wrong man? What if some key pattern to the murders had been overlooked? In the months after he first started thinking about that one book's errors, he repeatedly found himself running into some of the Strangler's old haunts and eventually decided to

Contributing editor **BRIAN RAFTERY** (brianraftery@gmail.com) *also wrote this issue's story about* America's Funniest Home Videos.

19.05

Wired also uses an arrow to suggest the direction of navigation.

One problem with using the swipe gesture to move back and forth is that it can interfere with other elements on the page that require horizontal navigation (in particular, with carousels). Most of the time when users flip the page, they do not position their finger consistently in a particular spot on the page (e.g., lower right corner); instead, they tend to do it as if they used a physical book. If there are any spots on the page where the swipe gesture does not work, the user will perceive the application as erratic.

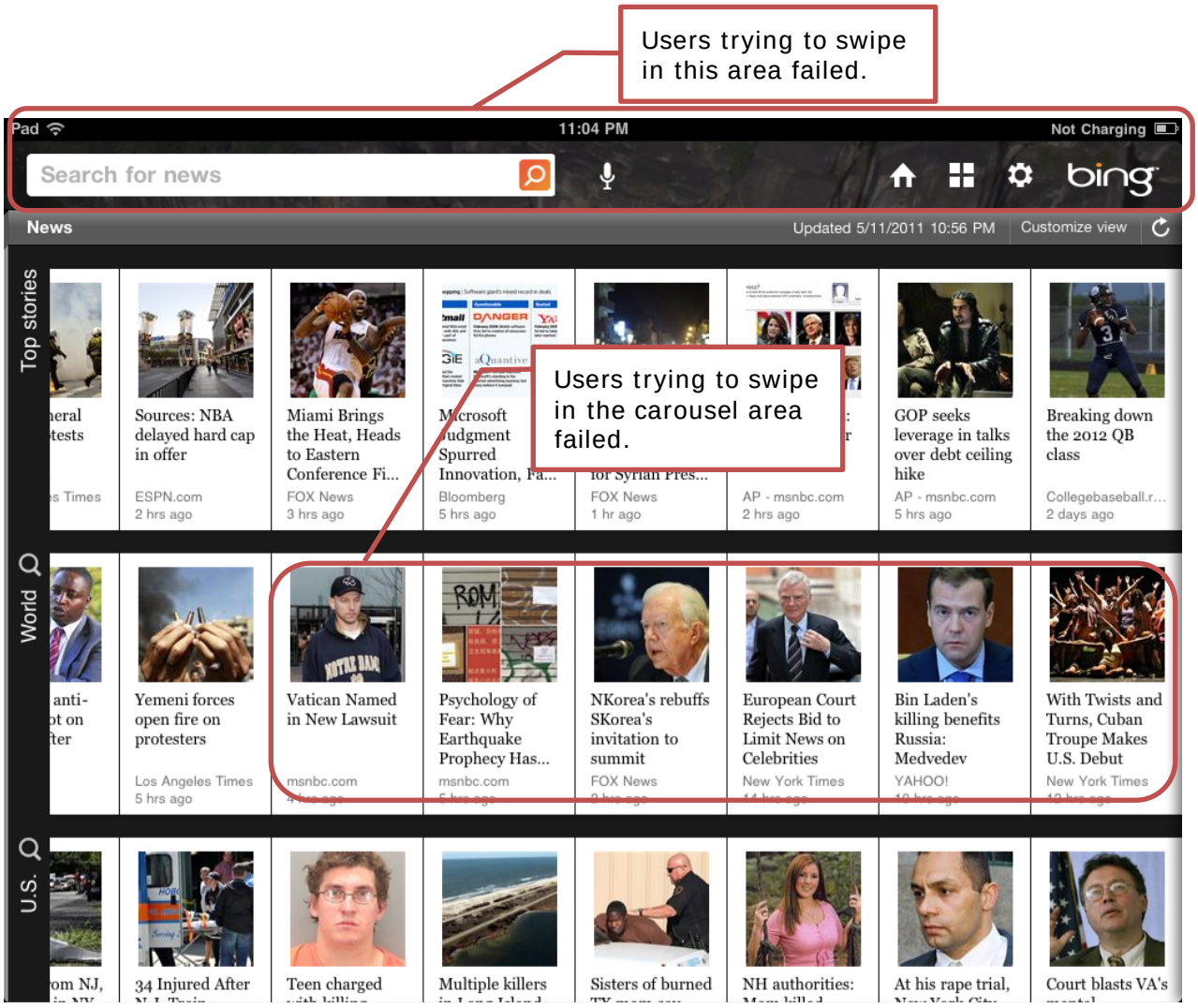
In our testing, there were two instances where Bing ran into problems because of the swipe gestures:

(1) The navigation bar at the top. If the user swipes in the navigation bar, nothing happens.
(2) Carousels. If the page contains a carousel, moving forward to a different page can be done only if the user touches the screen *outside* the carousel area

One of our users, who was initially enthusiastic about the swipe gesture ("I like it — it's a neat effect"), tapped on an article in the News section of Bing. He then wanted to swipe back to the News headlines, but failed because he kept hitting the top left corner (in the navigation bar). His sentiments toward the app changed:

> "On second thought I would like a back button there because it didn't work when I wanted it to."

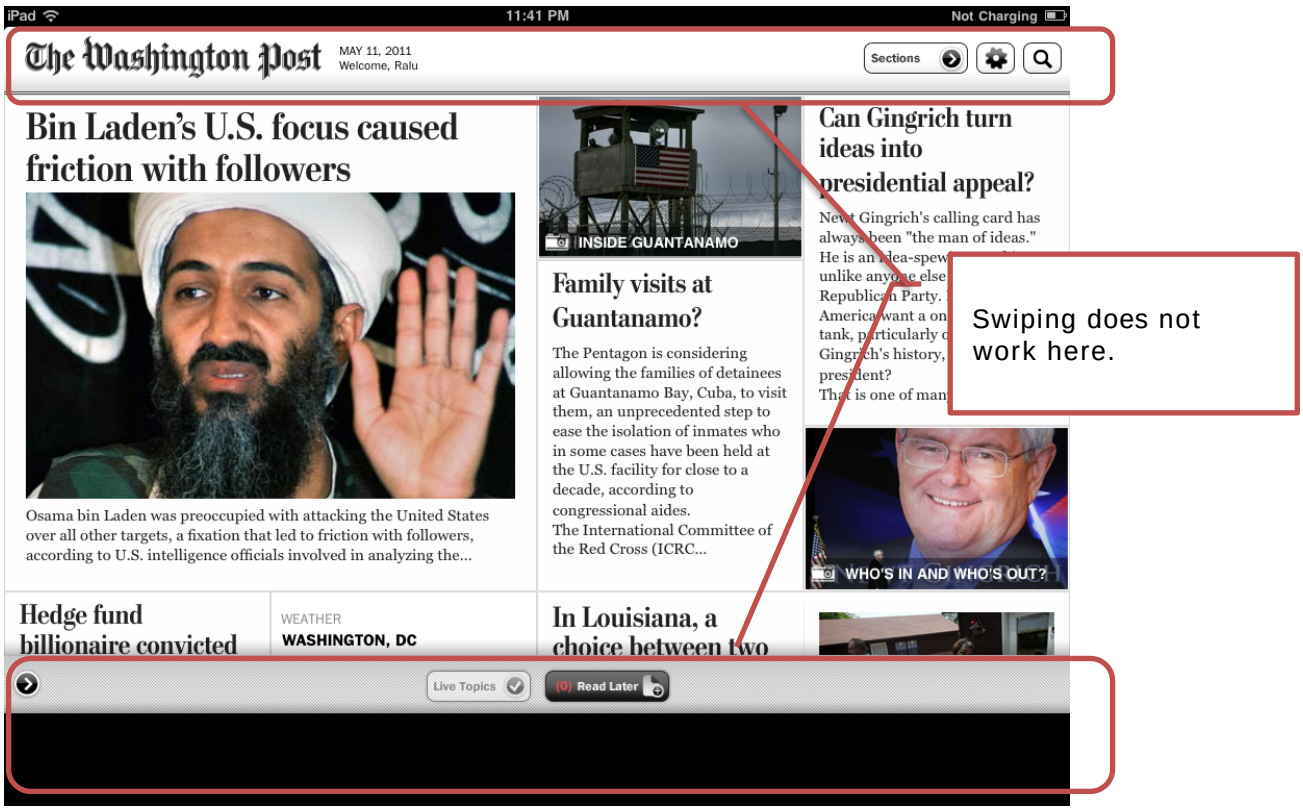
We also encountered several users who had trouble moving forward in Bing because they were swiping in the carousel area.



Bing uses the swipe gesture to move back or forward. Unfortunately, the spot where the gesture is initiated influences whether the gesture is successful or not.

Does that mean that the swipe gesture is doomed? That we should simply stay away from it? No, it just means that we have to take into account the fact that users won't necessarily hit a specific spot. (If we want them to hit a specific spot, then we're better off providing a button). What we do know about swiping gestures is that they are typically made close to the sides of the screen (although where on the sides we cannot tell), in the same way in which people turn the pages of the book. That means that leaving some margin of safe, non-interfering space (not necessarily whitespace, just not a carousel) around the vertical edges of the screen will be good-enough in most situations. Not covering the page with carousels is the other thing that we can do: if the carousel occupies only a small proportion of the page, the chance that the user will hit it when swiping will decrease.

An example of successful swiping comes from Washington Post. Although, as in Bing, swiping does not work in a narrow strip at the very top of the screen, Washington Post avoids the problems that Bing ran into by ensuring that most of the screen space allows swiping.



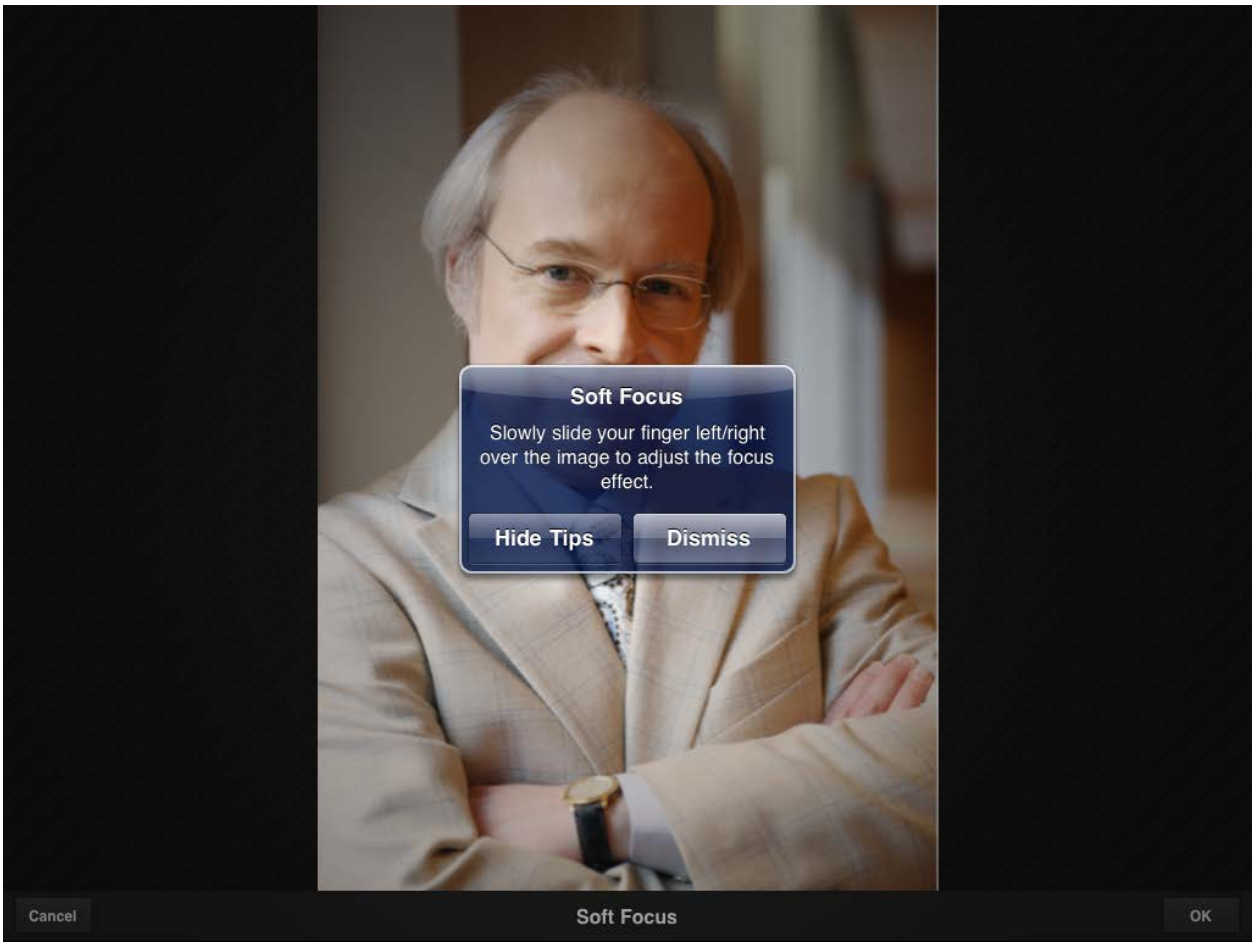
Washington Post. Swiping allows users to move between sections (as well as between articles within a section). Although swiping doesn't work in the top navigation bar or in the area at the bottom, it works elsewhere on the page.

Let's summarize with a list of recommendations for using the swipe gesture:

- **Give users visible cues (arrows, tips) that they need to use the swipe gesture.**
- **Make sure that the page contains enough space safe for swiping next to the two vertical sides.**
- **Avoid covering the page with carousels and other design features that interfere with swiping.**

GESTURES IN PRODUCTIVITY APPS

Several productivity apps use gestures to allow users to perform different operations. For instance, in Adobe Photoshop Express, users had to use various gestures to manipulate pictures. The gestures worked well for all our participants — they were able to easily complete their tasks and pleased with the application. One thing that helped was that Adobe offered tips whenever users attempted an operation. The gestures were relatively simple, and they did not require the use of more than one finger.



Adobe Photoshop Express required gestures to manipulate photos and displayed tips to make the gestures more discoverable. This particularly helped users understand how to use features that had no perceived affordance: in this example, there's no explicit UI widget like a slider to manipulate for changing the extent of the photograph's "soft focus" adjustment. (Instead, you're supposed to move your finger back and forth directly on the photo itself until you like the way it looks.)

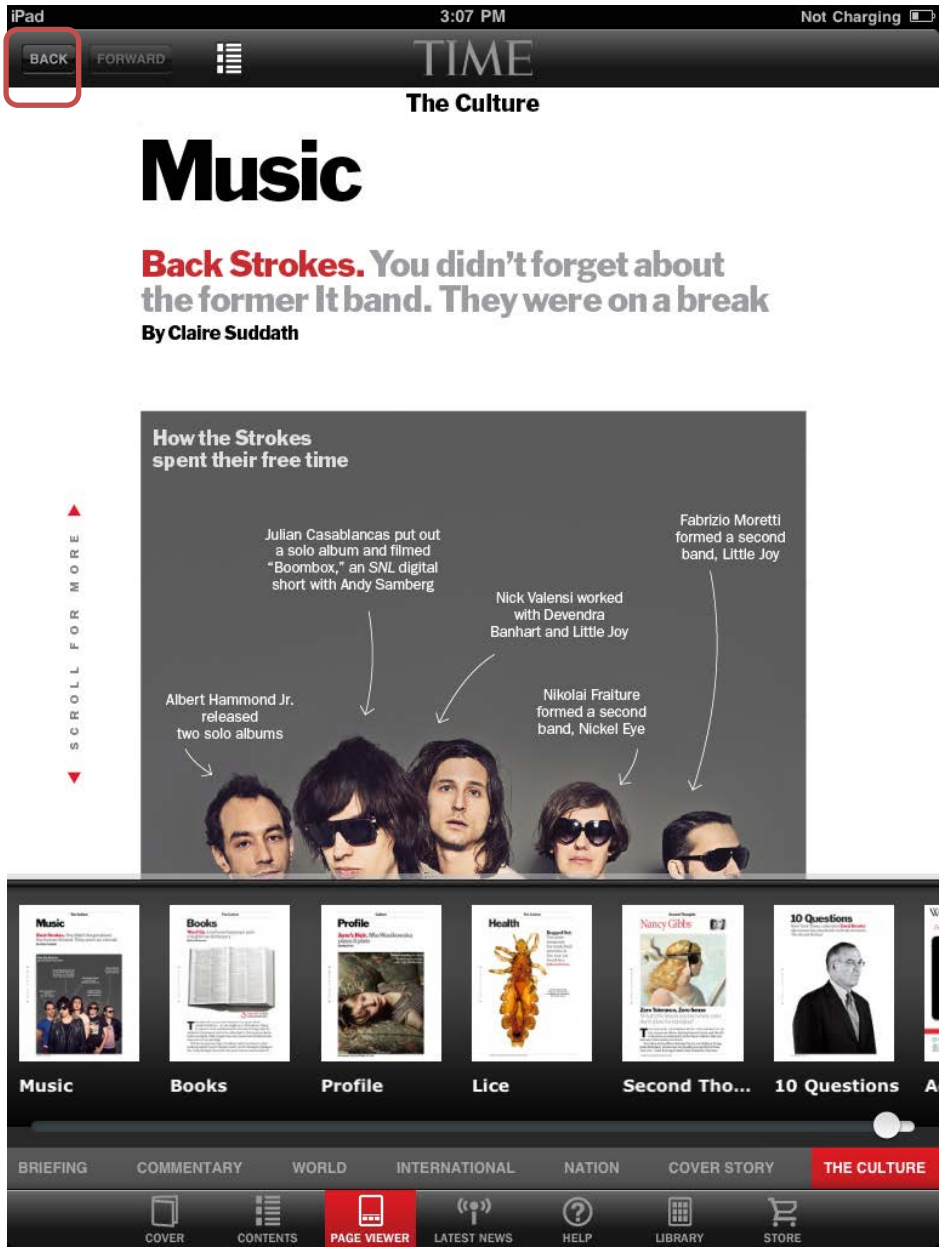
Navigation

ACCIDENTAL TOUCHES AND THE BACK BUTTON

In last year's report, we argued for back buttons on touch screens: with a large screen such as the iPad it's easy to accidentally touch something. In the absence of a back button, users get lost.

We're happy to report that many magazine apps have been converted, and many of them have added a back button to their navigation bar. Examples include Time, Vanity Fair, New Yorker, and Wired.

Wired magazine. The navigation bar at the top includes a back button that allows users to easily undo the consequences of accidental touches.



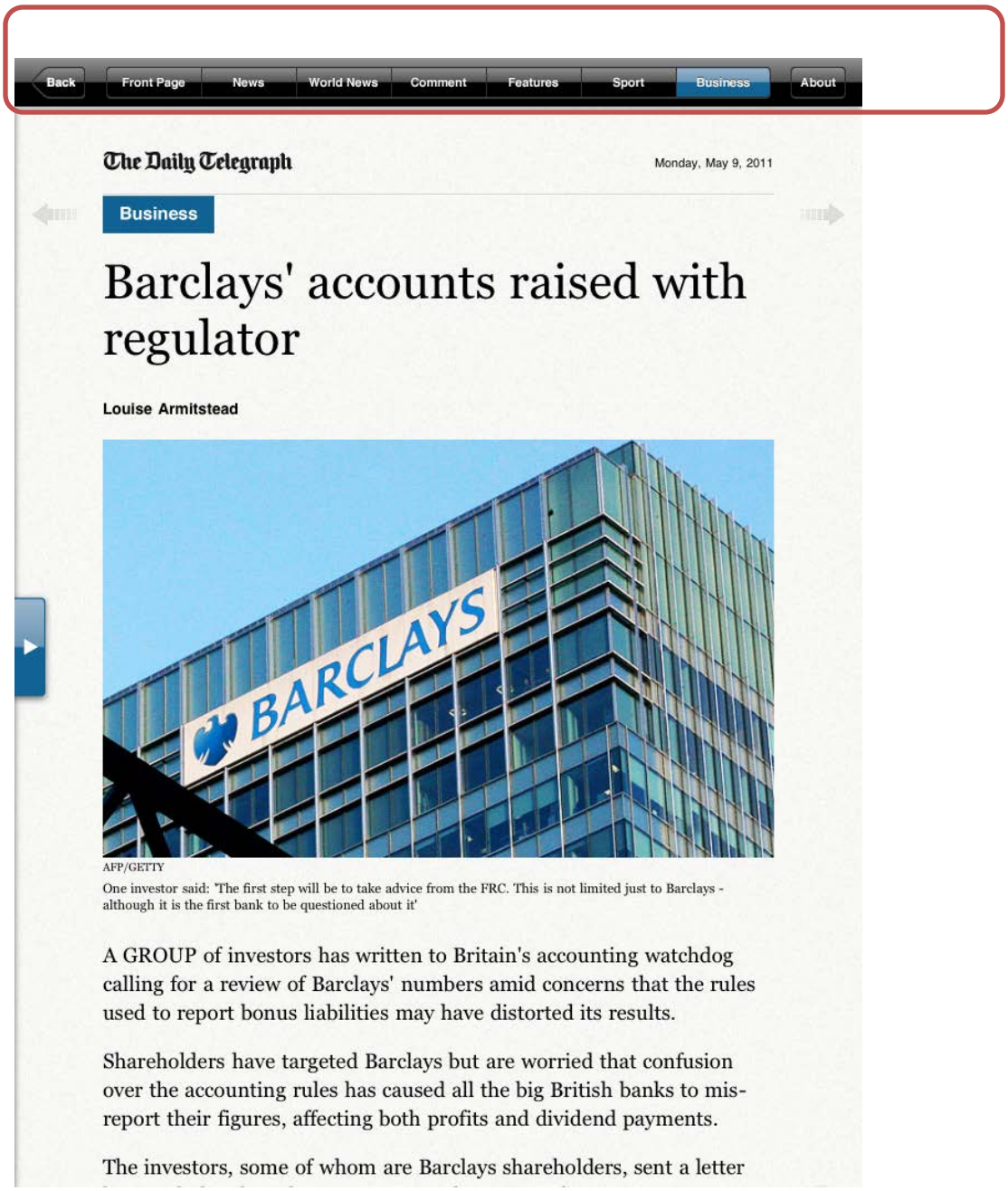
Time Magazine. The back button is part of the top navigation bar. The page viewer presents thumbnails of the different articles in the magazine; users can browse through the page viewer to select a new article.

A back button is required whenever the app allows users to jump back and forth between pages. Magazine apps often have page viewers (as in the Time screenshot above) and contents popovers that make it easy to navigate from article to article. The back button saves the user the effort of browsing again through the magazine to find the previous article. Magazine apps also contain hyperlinked content — for instance, most magazines link from the table of contents page to the different articles. In the screenshot below, which is taken from a recent issue of The New Yorker, the different subsections of "Goings about the town" can be visited through hyperlinks; using the back icon in the top navigation bar, users can quickly go back to the previous article that they visited.

Different subsections of the column can be accessed through hyperlinks.

The New Yorker. Different subsections of the "Goings on about town" column could be accessed through hyperlinks. The top back button supports the retracing of the sequence of visited articles.

A lot of newspaper apps do not use back buttons. The Telegraph is one of the few newspapers that uses a back button and has a navigation bar on every page, enabling users to move between different sections without going back to a news-listing page.



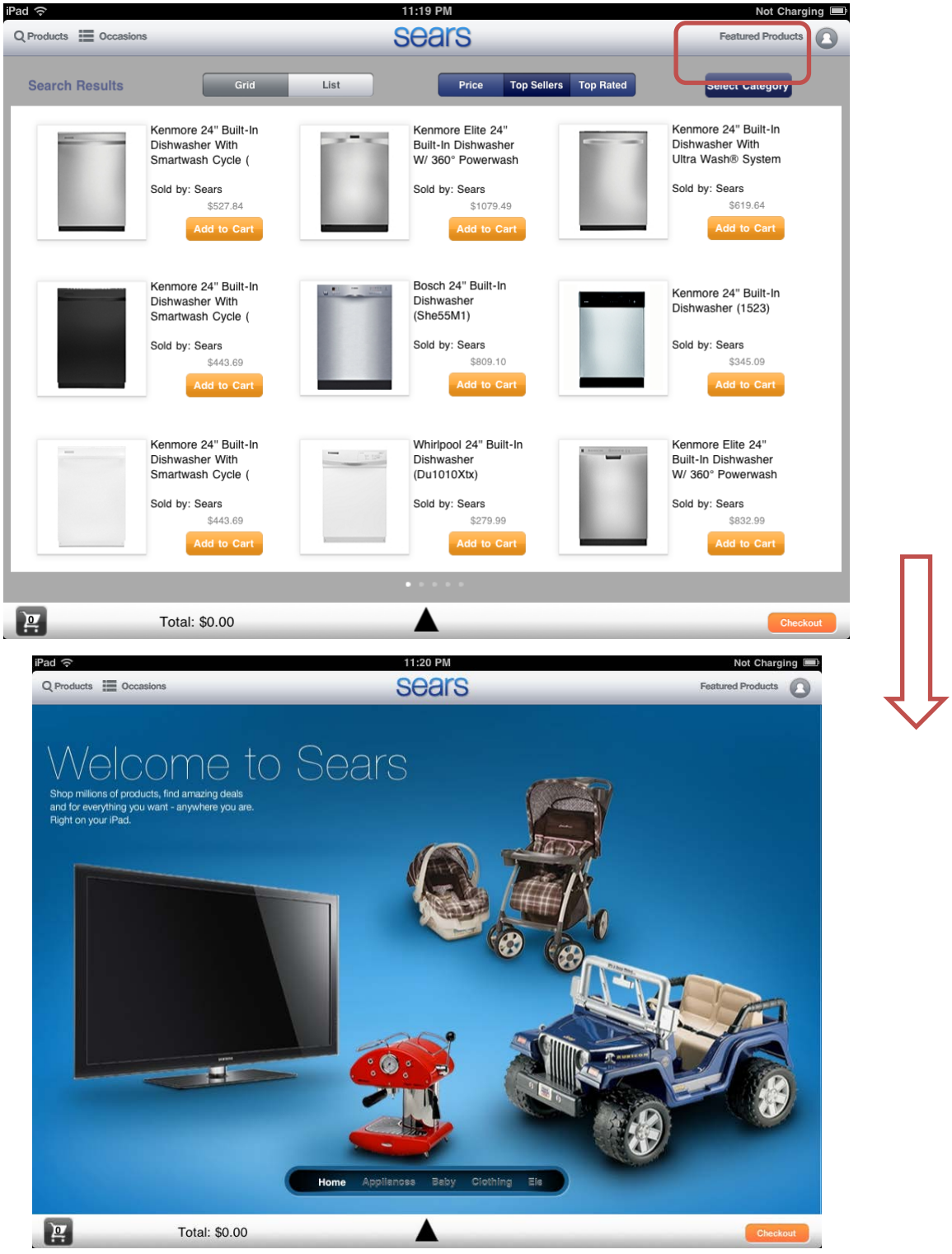
The Telegraph. The navigation bar and the back button allow users to quickly retrace their steps or go to a new section.

Many apps have a hub-and-spoke navigation model that requires users to read an article and then go back to a listing page. The article is often displayed in an overlay, and that makes the back button apparently unnecessary (since the user can dismiss the overlay and return to the list of articles).

However, sometimes the page contains other hyperlinks that can be accidentally touched. These links may include top navigation bars, settings links, or any other kinds of links that often look unrelated to the natural task flow of the app, but that can be accidentally touched.

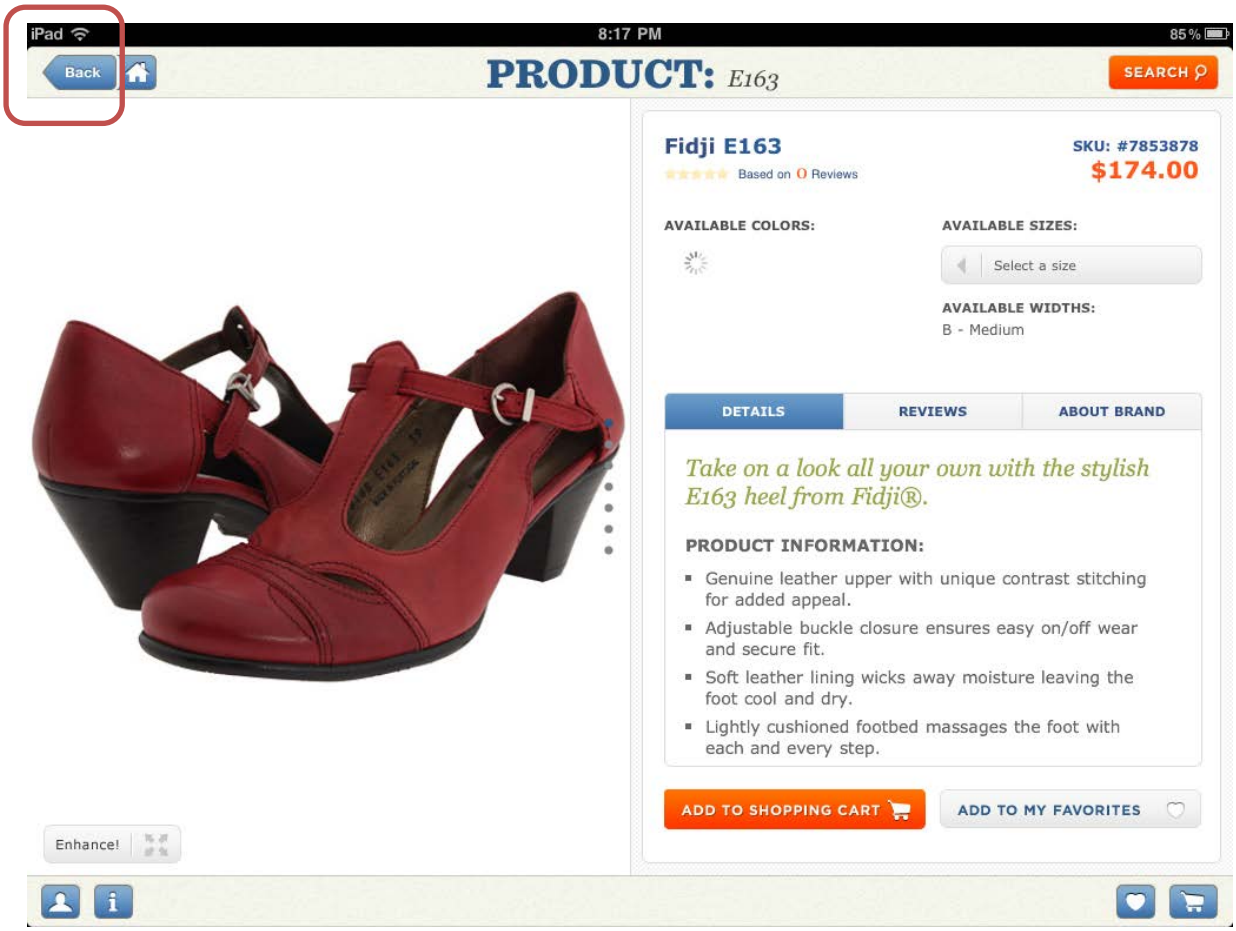
We go back to the Sears app with an example from our testing. One of our users performed a search for a dishwasher and got a long list of results. He then looked around the page for

some filtering options. He tapped the “Featured products” link, but he was taken to a completely different page and lost his search.



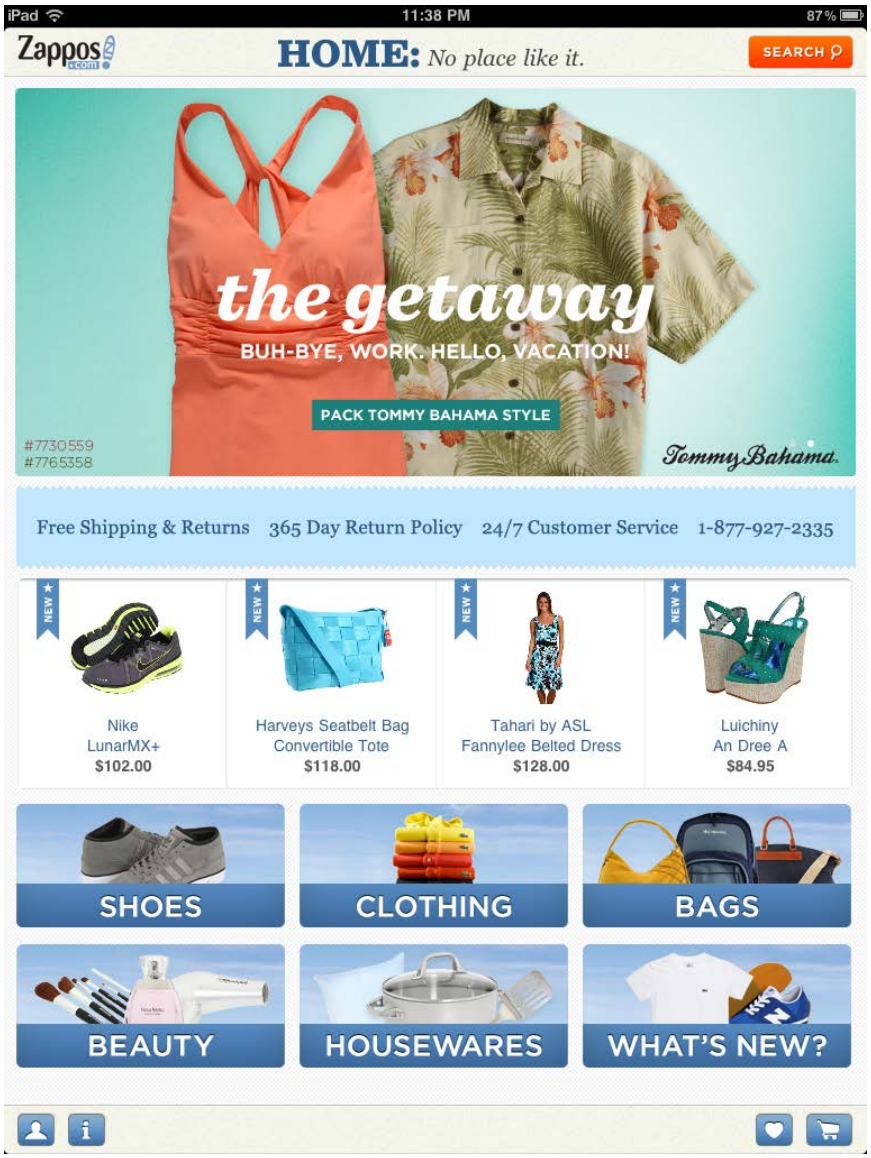
Sears app. A user tapped “Featured products” and lost his search results. He had to run his query again because the app had no back button.

Some e-commerce sites that display product info on a separate page also use the back button to allow users to navigate back to the search results.



Zappos. The back button took users to the search results page.

However, many of the sites which have a "Back" button (Zappos included) stop the back chain on the homepage. This exposes them to the same problem that Sears had in the example above: if the users hit home accidentally, they will lose the search results or the product that they were inspecting.

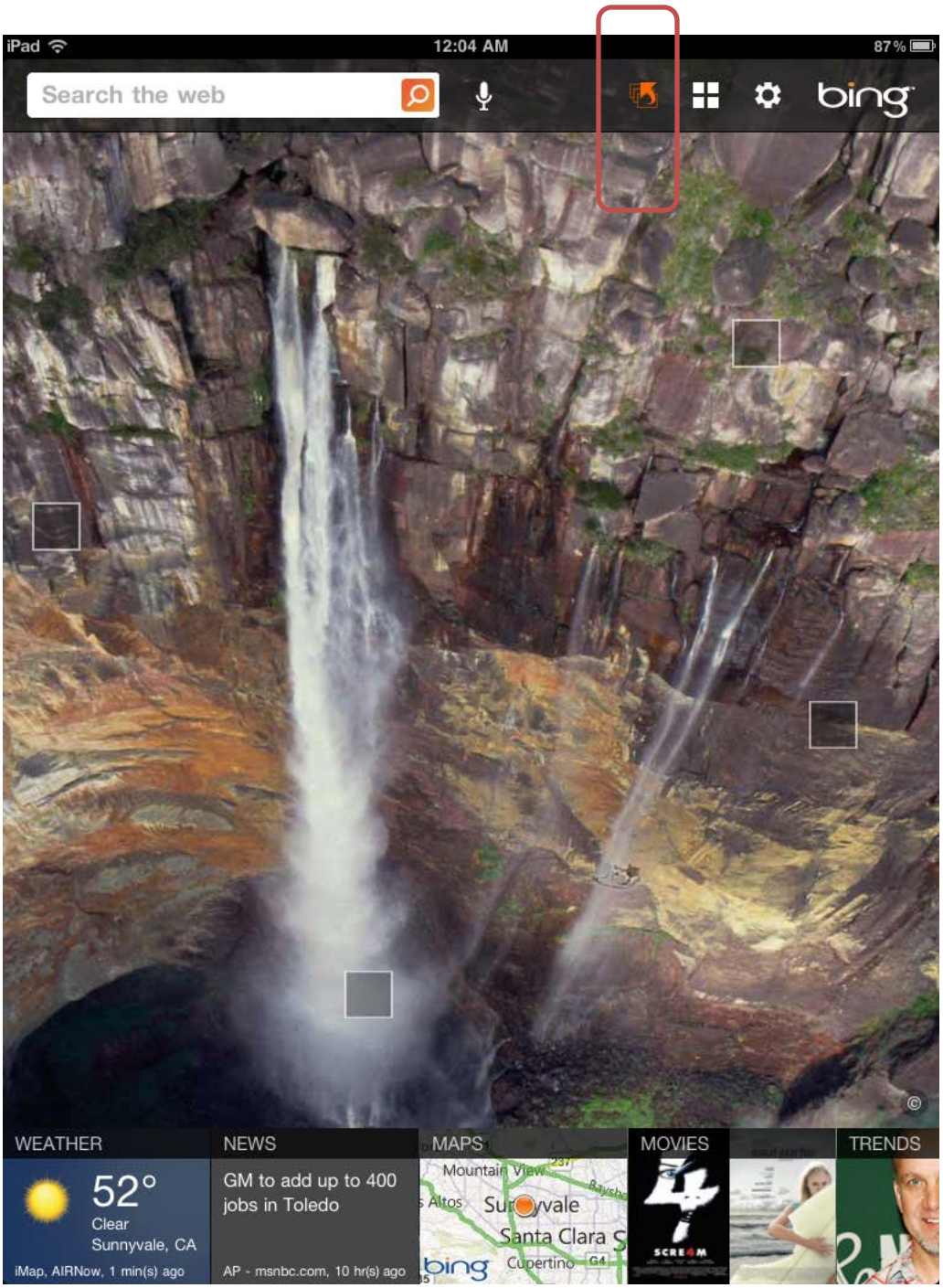


Zappos' homepage did not contain a back link. If users accidentally had hit the "Home" icon from the product or search-results page, they would have lost their product or search results.

That's why our recommendation is to include a true back button that protects the user against accidents.

If your app will have sections with no back button, at least make sure that the links to these sections are less likely to be accidentally touched. In the case of Zappos above, it means putting the "Home" link far away from the "Back" link.

Bings is one of the few apps which actually had a back button on the home screen (but not on the other pages, where it relied on the back swipe gesture to go back). Because of that, it is actually possible to reconstruct a navigation sequence even if the user hit the home button elsewhere in the app.



Bing has a back button on the home screen, allowing users to reconstruct navigation sequences that ended by pressing the "Home" icon elsewhere in the app.

To summarize:

- **Include a back button in your app to allow users to undo any accidental touches.**
- **Make sure that the back button also works on the home page.**

HORIZONTAL NAVIGATION: THE CAROUSEL AND HORIZONTAL SCROLLING

Horizontal navigation seems to have reached its apogee with the iPad: lots of apps make use of horizontal navigation, either in the form of carousels or of the deck of cards (where users flip through different pages of content).

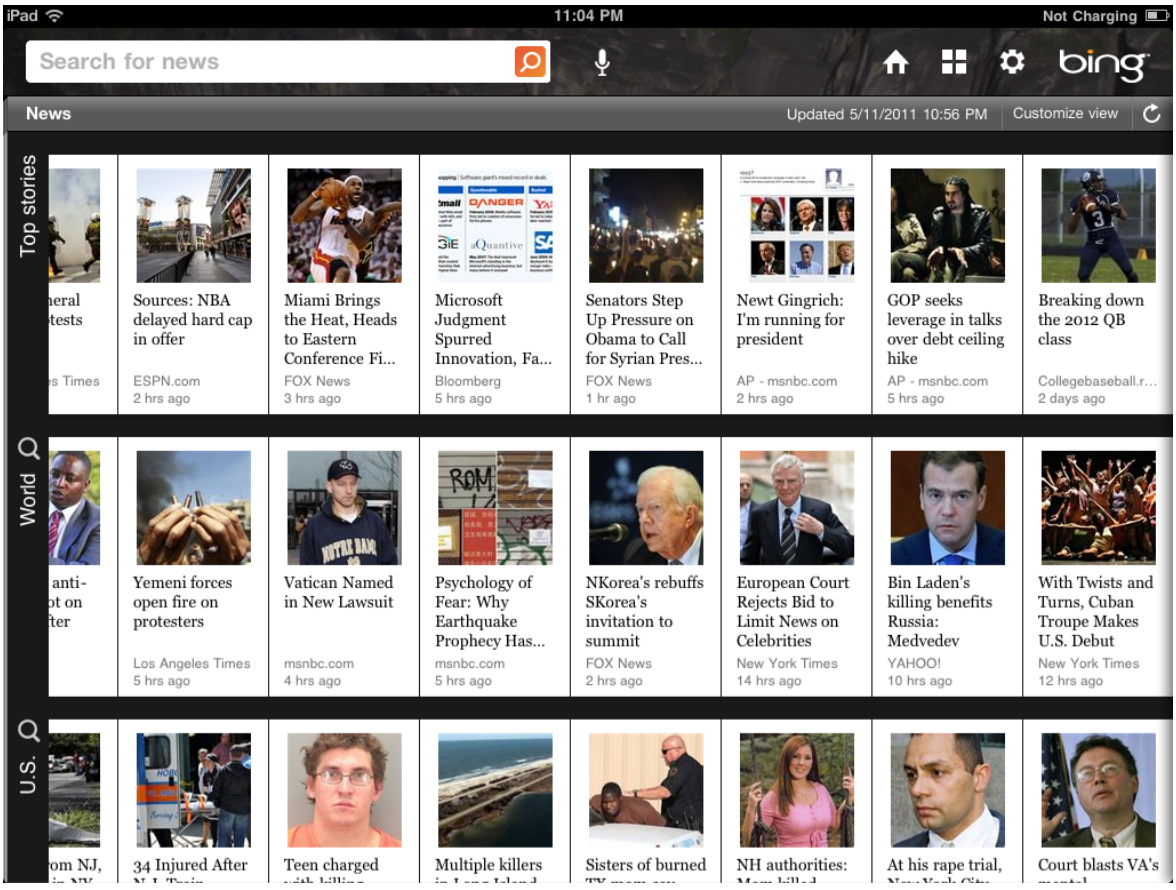
In last year's report, we noted that both these ways of navigation were quite successful: the deck of cards model seemed to work well in magazine and even newspaper apps, once users understood that the mental model of the app followed that of a paper newspaper or magazine. The carousel was also easy to use, if the affordance of horizontal swiping was good.

We discussed some of the problems with using deck of cards models in our section on gestures (page 55). Here we focus mostly on carousels and horizontal scrolling.

A plethora of apps use carousels. Many news apps displayed rows of pictures plus text, and several of our users commented that they liked that kind of display because they could get information from both the picture and the story title.

A user commented on the Bing app:

> "[The carousel] is my favorite type of design — you slide to see what you need. It shows the most amount of info without being intrusive."



Bing uses carousels for each news section.

In general, the problem of carousels is that they only display a small number of items at a time. There are situations where that can be ok; however, carousels are not appropriate for long lists.

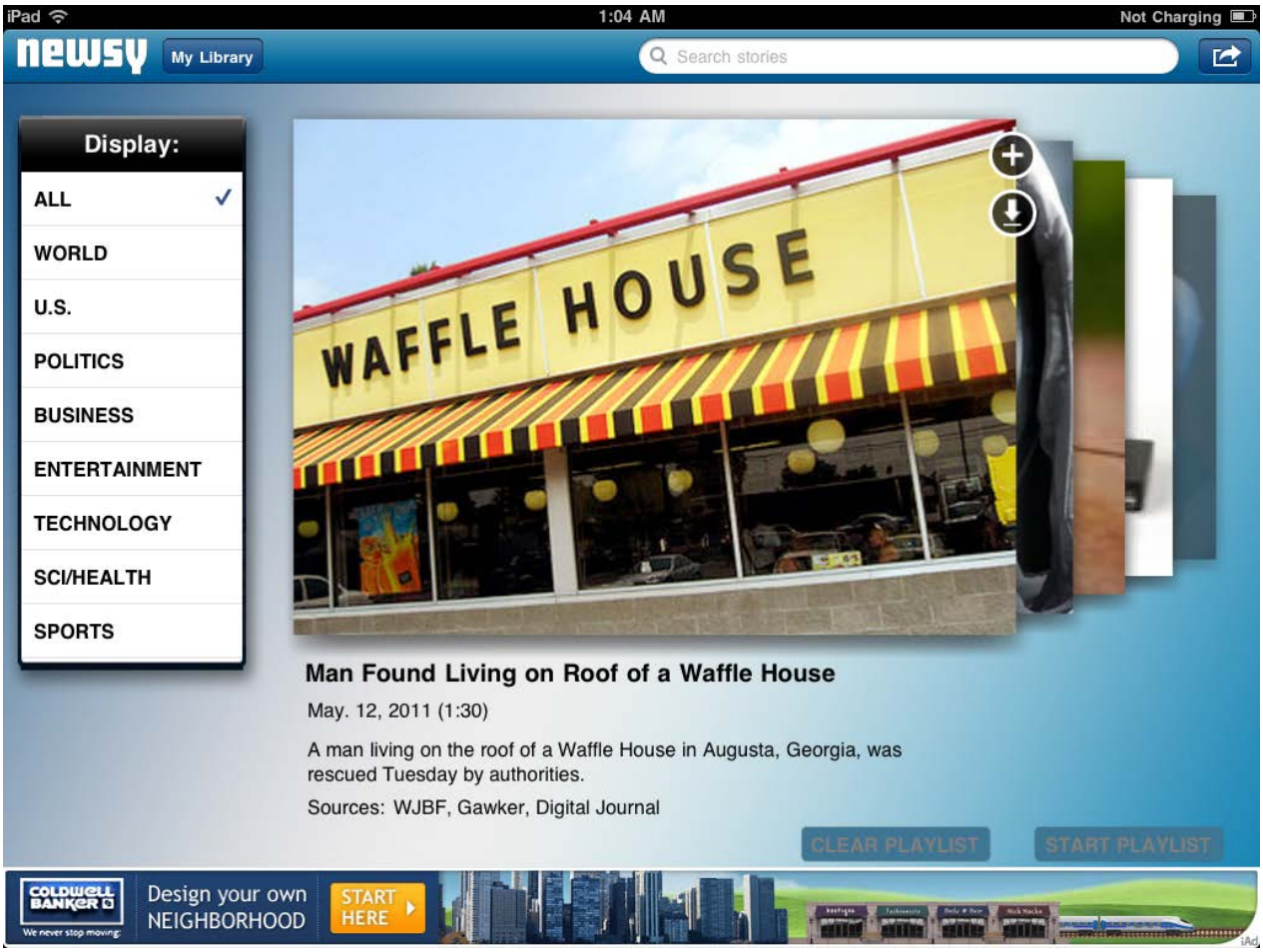
The Wine.com app uses a carousel to display the search results; unfortunately, that means that users have to flip through all the results in order to find one that they like. Information such as rating or price, often used to visually select items from a list, is not available in a carousel display.

Wine.com app. The list of search results is displayed using a carousel. Users need to flip through all the 127 wines to make a selection.

Newsy also uses a carousel to display news videos; users need to swipe through the videos, one at a time. The user who had Newsy installed on his iPad commented:

> "I like the flow of this — that you can just swipe through. It's really simple to navigate, easy to understand. But I don't use this [app]."

Although the display may seem exciting in the beginning, swiping through a lot of videos gets tiring quickly, especially because there is not a lot of content to be read about each of them (so the users end up swiping almost continuously).



Newsy (in landscape orientation) shows video descriptions in a carousel.

Apps such as Amazon Windowshop use a two-dimensional carousel, where users can scroll horizontally and vertically. Some of our participants were overwhelmed by the many pictures and the horizontal navigation. While using Amazon Windowshop app, one of our participants remarked:

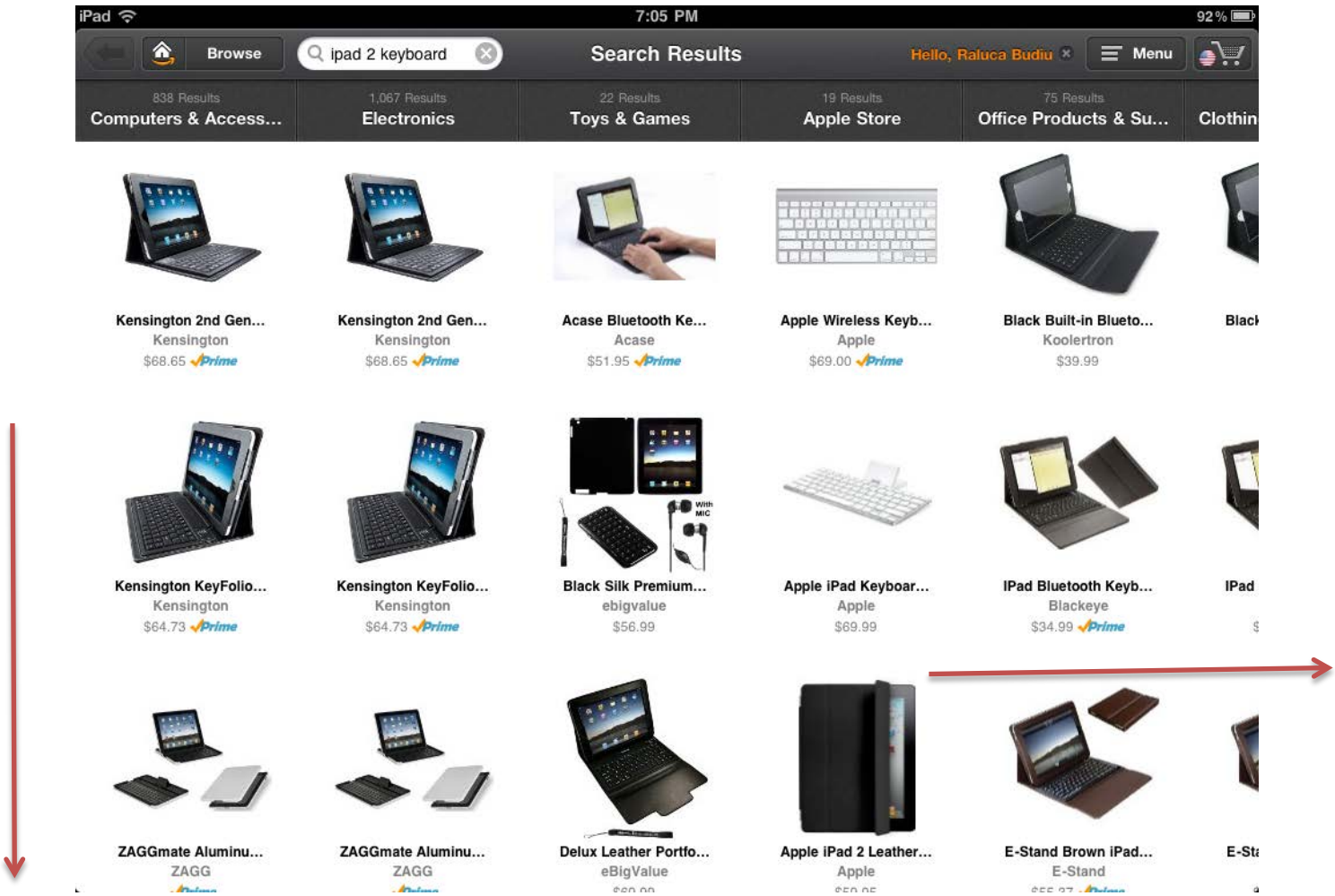
> "Horizontal drives me nuts. Why do they have horizontal processing? I cannot concentrate."

Another person commented;

> "I would like a grid separator to make it look more uniform…"

Another problem with the Amazon Windowshop display was that there was no natural order for scanning the different products: users sometimes looked horizontally across categories and sometimes they looked within one category. No user exhibited a single strategy (e.g., going only within one category). With that kind of display, it is easy to forget which items were visited and go in circles; in fact several users went back and forth and revisited products. (The fact that certain items were listed in multiple categories did not help either). As one user put it:

> "I wish they had history — I forget what I looked at."



Amazon Windowshop. The same products are repeated multiple times (in different categories). Users can scroll horizontally and vertically to navigate. This display makes it hard for people to remember the items that they've visited before.

Here's the summary about carousels:

- **Carousels are not appropriate for long lists (for instance, for search results).**
- **Many carousels on the same page can visually overwhelm some users.**
- **Two-dimensional carousels make it harder for users to remember which items they had already visited.**

Orientation

PREFERRED ORIENTATION

Participants in our study sessions were told in the beginning that they could use whatever iPad orientation was most comfortable to them and could switch orientations as they saw fit. Most of the time, our participants picked an orientation at the beginning of the session and used it for the entire session. They rarely switched orientations spontaneously, and when they did so, it was because they thought they would get a better look at a picture or see the text in a larger font or watch a video full screen. Sometimes the application forced them to work in a different orientation.

Slightly more users mentioned that they preferred the landscape orientation for the iPad. A seemingly-related factor was whether they were using an iPad cover; those who did mentioned that they often propped their iPad up in landscape orientation.

> "My computer screen at work and my laptop screen at home is landscape. Intuitively, when I am looking at an electronic screen, my mind tells me to look at it in landscape mode. I try to play around with landscape versus portrait in the context of photos. [For] anything like reading or viewing a video, I automatically switch to landscape mode."

CONSTRAINING ORIENTATION

Some apps only work in a single orientation, forcing the user to turn the iPad in that orientation. For instance, QVC only works in portrait and Amazon Windowshop only works in landscape.

Users were not terribly bothered by having to use the iPad in one orientation (although they may be bothered more in naturalistic contexts, where they would not be sitting at a table). One user tried to change orientations for the QVC app and noted that it didn't work; then she commented that changing orientation is not very reliable on her iPad and wondered whether there was any issue with the device.

Another participant who normally preferred the portrait orientation, said that he was not bothered by having to use Amazon Windowshop in landscape mode:

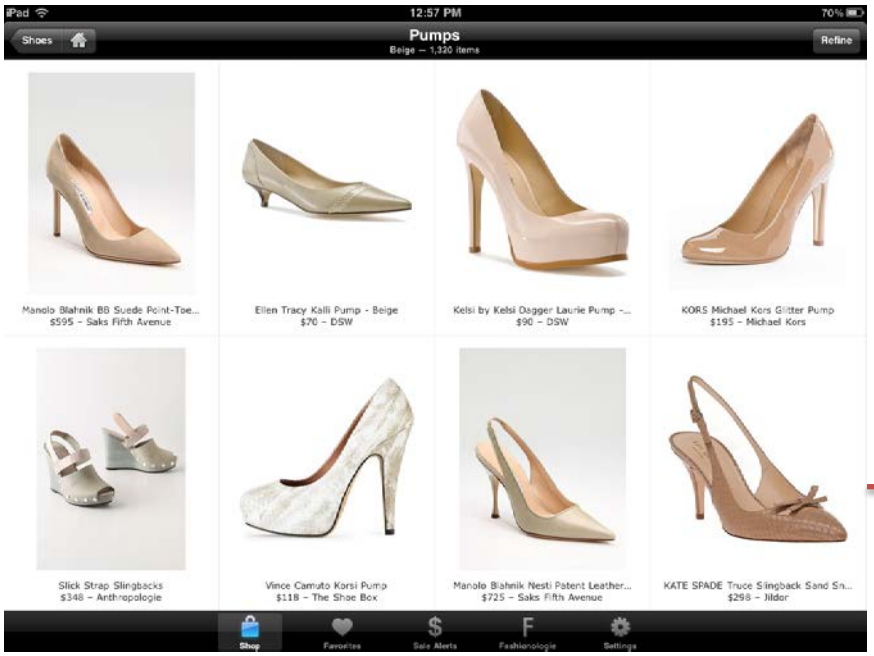
> "I like this orientation — I didn't think I would; it makes it so seamless and stylized … I like it this way."

Does that mean that designers should pick one orientation and stick with it? No. As mentioned before, **users tend to switch orientation when an impasse occurs** and, if the app doesn't support them, their flow is going to be disrupted and they are going to wonder why it's not working.

INCONSISTENT NAVIGATION (HORIZONTAL AND VERTICAL) ACROSS ORIENTATIONS

Some applications use a different navigation direction in the two orientations; for instance, they use horizontal navigation in landscape and use vertical navigation in portrait.

An example is Shop Style. To navigate, users have to swipe horizontally in landscape mode, and swipe vertically in portrait.



(a)

(b)

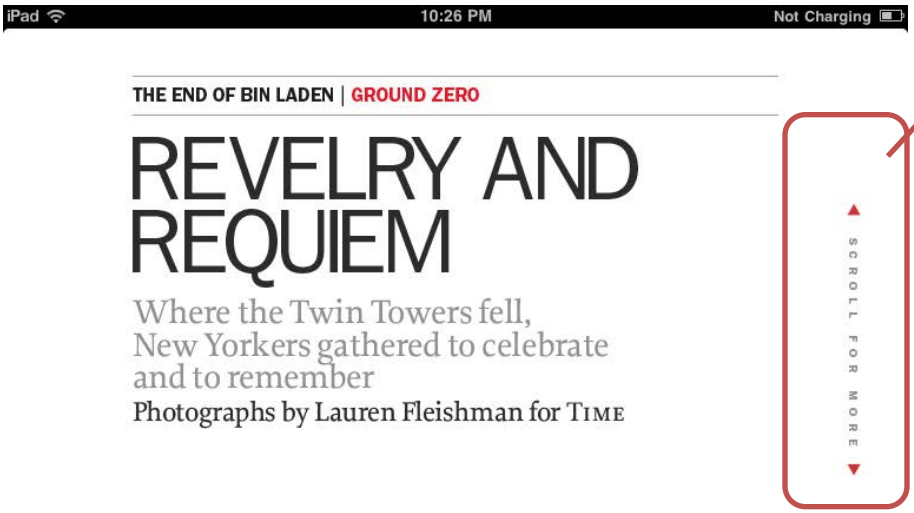
Shop Style uses horizontal navigation in landscape and vertical navigation in portrait.

Although users do tend to stick to an orientation during one session, that doesn't mean that they may not switch or that during the next session they will use the same orientation. When people change orientations, they expect the same kind of interaction from the app — switching orientations should not mean switching apps. Inconsistent navigation across orientations also degrades the learnability of the app: it's harder for users to associate any particular navigation scheme with that app.

Magazine apps sometimes have different navigation schemes in the two orientations. Time is an example: in portrait mode, users scroll down to read an article and swipe forward to move to the next article. In landscape they swipe through the pages of the magazine.

Users are slightly more likely to change orientation when using a magazine app than other types of app, mostly because these apps contain content that has a preferred orientation (e.g., pictures or videos). In our testing, participants fumbled a bit with Time until they discovered what they were supposed to do when they changed orientations. Switching from portrait to landscape was especially painful, because users attempted to scroll vertically to no avail.

(a) Landscape version of Time. Users must swipe horizontally to read the next page of the article. There is no cue on the screen to help them figure it out.



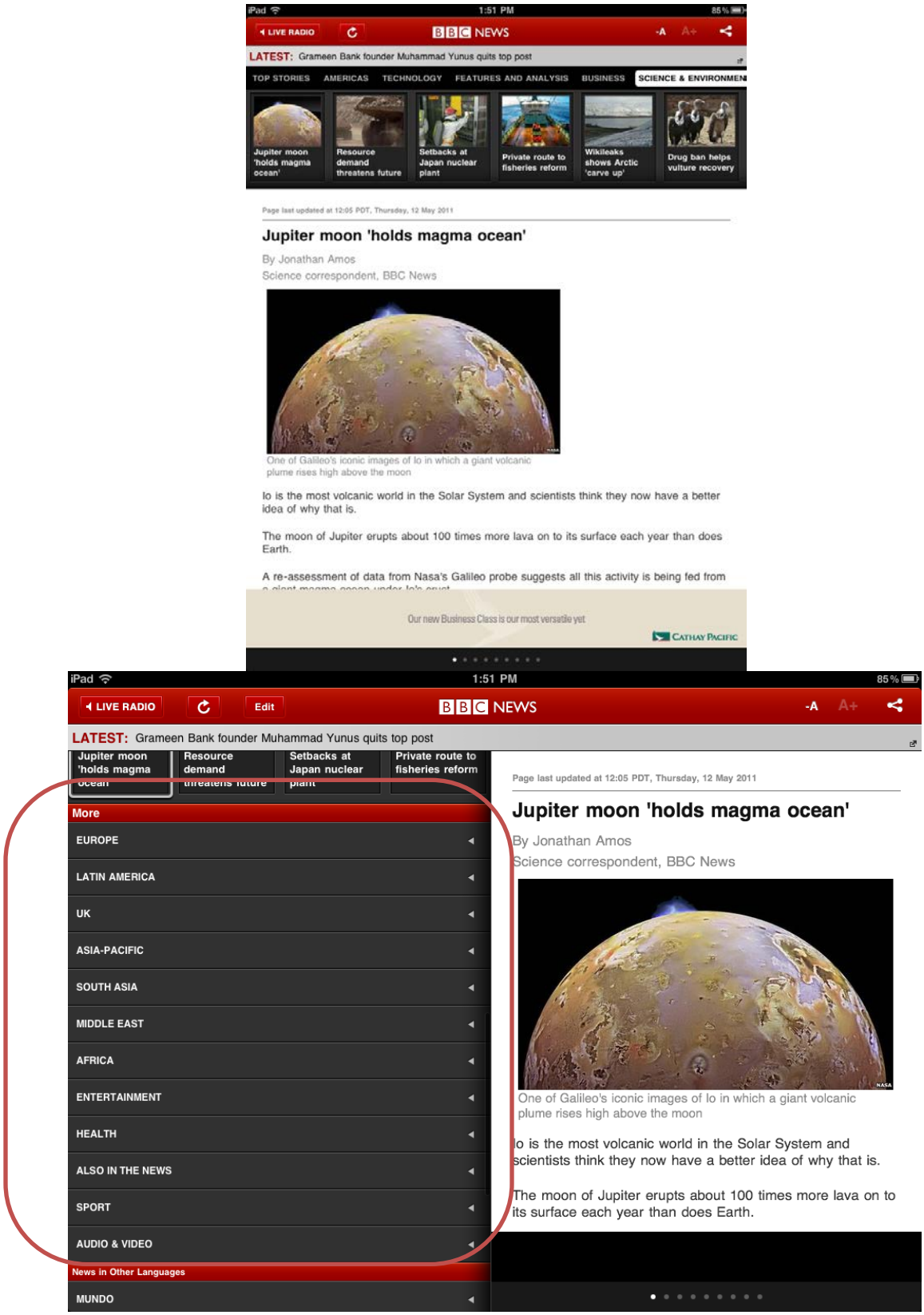
The text ("Scroll for more") does tell users what they are supposed to do.

(b) Portrait version of Time. Users need to scroll vertically to read the article (see also instruction on screen). Forward or backward swipe leads to the next, respectively previous, article.

Our recommendation is to make sure that the same navigation scheme is used in landscape and portrait orientations.

INCONSISTENT CONTENT ACCROSS ORIENTATIONS

In last year's report, we talked at length about how some apps do not have the same content in the two orientations and how users do not necessarily think of changing orientations to get to additional content. The BBC News app still has different sections available in landscape and in portrait orientation.



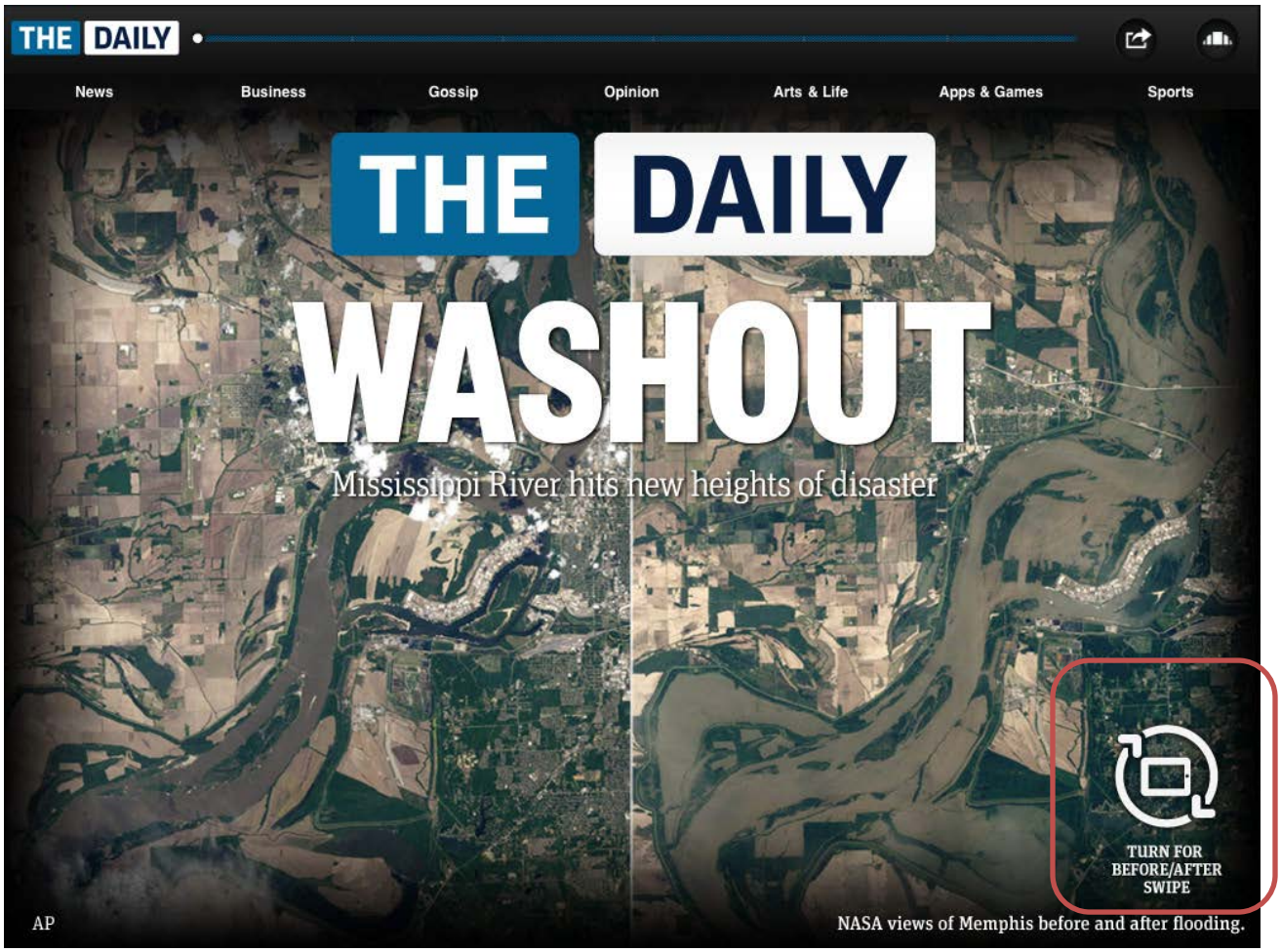
BBC News. Many news topics are only available in landscape.

The problem affects magazine apps in particular, because they work with different layout constraints in the two orientations. To satisfy these layout constraints, they end up tweaking the content (especially photographs) so that it works well for each orientation. This solution probably involves high costs on the production side (as the magazine has to come up with two layouts for each issue), and also frustration on the user side. When users change orientation to get a better view of a picture, it is frustrating to suddenly not find the picture anymore and have to search for it (possibly without success).

The example below comes from the latest issue of Wired: the landscape and the portrait view of the same article contain different photos.

Wired magazine. Some pictures are available in a single orientation.

When content is not available in one orientation, tell users that they may find extra information when they turn the tablet. This is exactly what The Daily does: when one of their interactive features was only available in portrait mode, they had an icon in landscape to suggest users to switch orientations. Note also how The Daily does not shy away from telling users how they are supposed to interact with their feature.



The Daily. The icon and the text tell users to turn tablet in portrait mode.

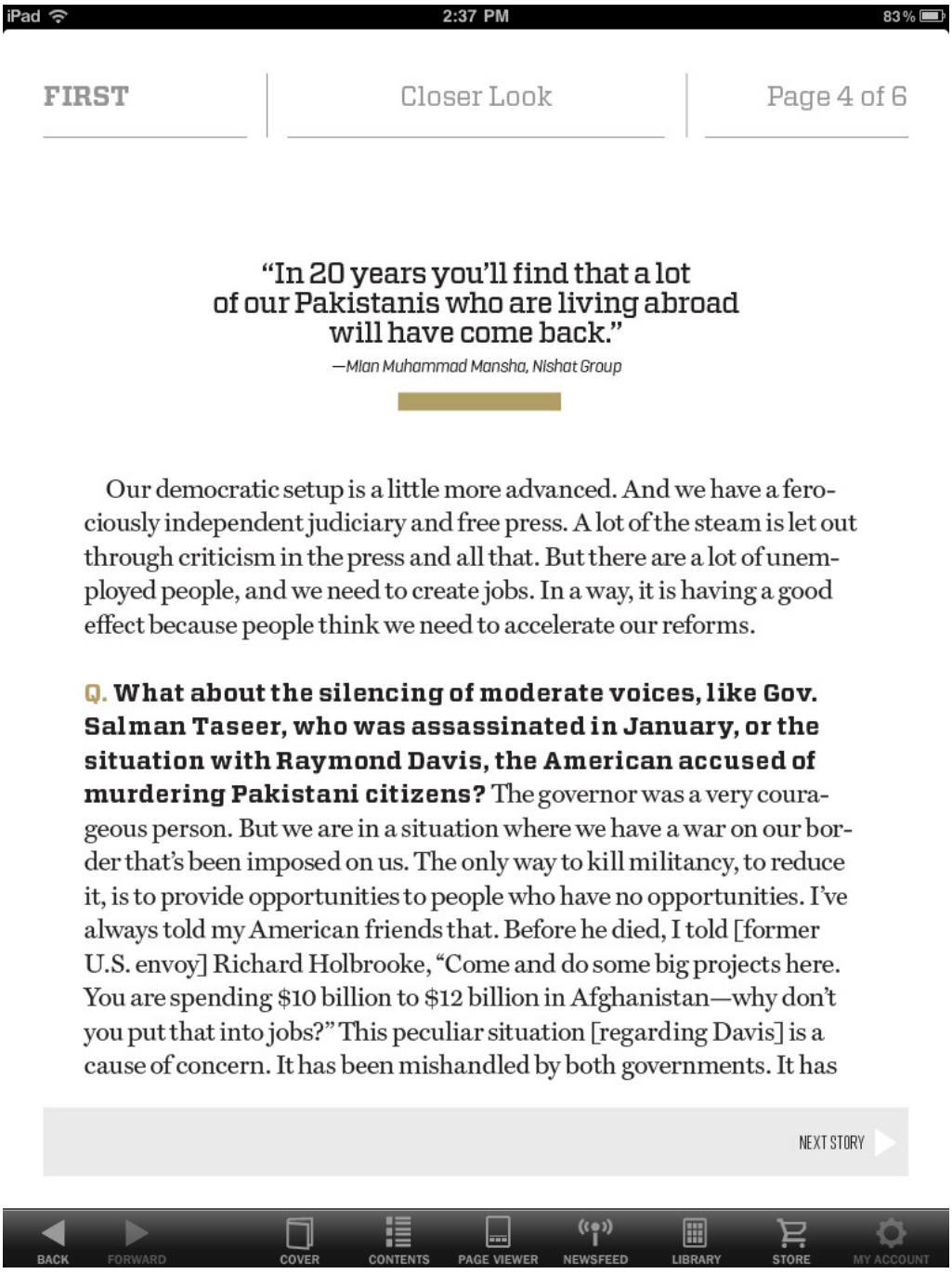
The Daily. The interactive feature is only available in portrait. Instructions on the screen tell users how to operate the interactive feature.

When users switch orientations in the middle of an article in the Time app, they are suddenly taken back to the beginning of the article and have to find their way back to the content they were interested in. This breaks the general HCI principle[9] of perceived stability and thus risks disorienting users and/or making them feel that they have lost control of their own user experience.

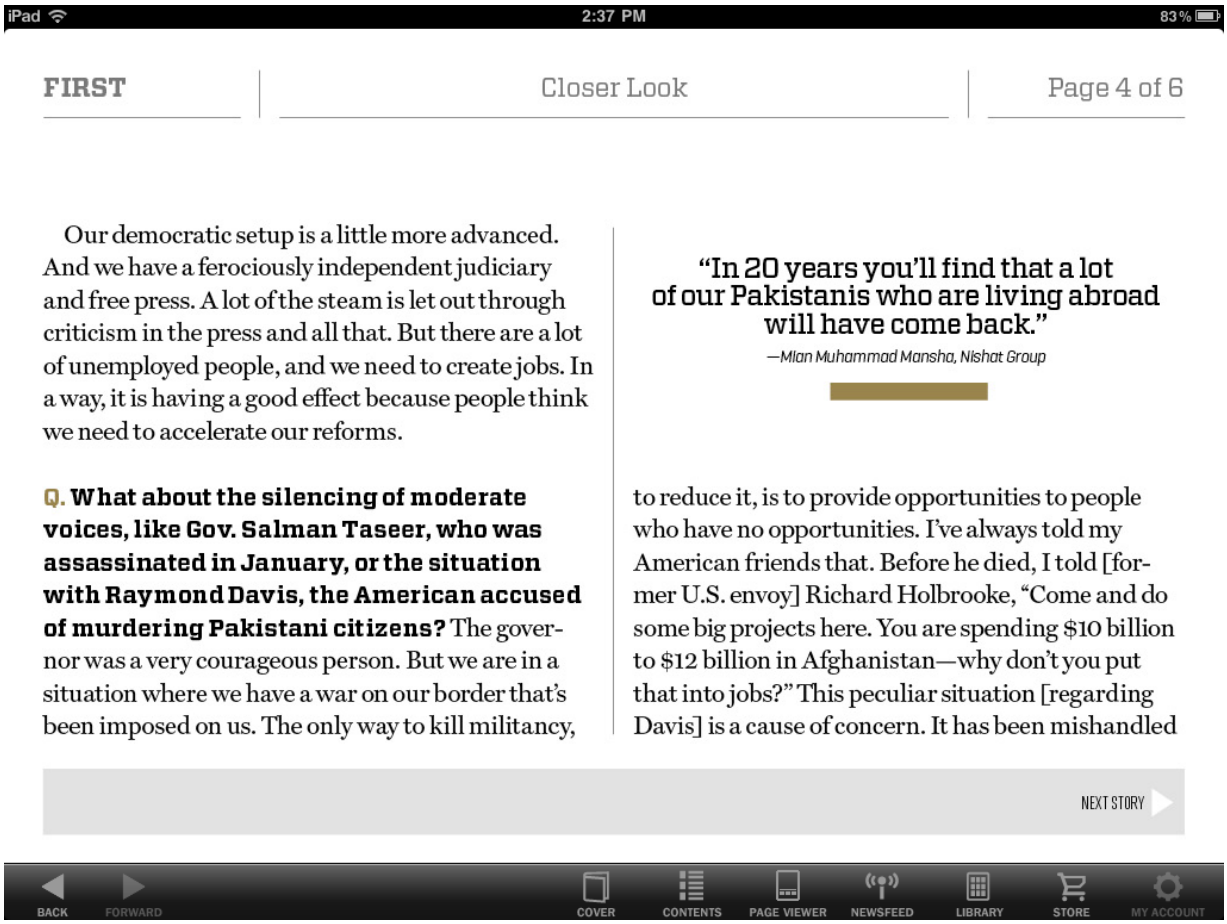
[9] Please see our seminar *From Science to Design: Applying HCI Principles to Real World Problems* for more information about human–computer interaction principles http://www.nngroup.com/events/tutorials/hci_principles.html).

Time app. If users change to landscape on this page, they are taken back to the beginning of the article.

Fortune does a good job of keeping the content at the page level consistent across orientations. They are not perfect, but they choose wisely: they found some memorable breaking points (e.g., questions, quotes, new paragraphs) on the page and made sure those breaking points were persistent in both landscape and portrait.



Fortune magazine app: portrait version of an article page.



Fortune magazine app: landscape version of the same page. Note that the same questions and quotes are present on the page; the content is very close in the two orientations.

To summarize:

- **Keep the same content available in both orientations, at both article level and page level. To make the content consistent at the page level, look for natural breaking points (e.g., new paragraph) and keep those in both orientations.**
- **Keep users at the same location (within the content) when they change orientation. In particular, when users rotate the tablet back to the previous orientation, reestablish the previous view.**
- **If a feature is only available in one orientation, tell users that they will find extra content by turning the tablet.**

Initial Experience

DOWNLOAD TIME

We often get asked to estimate for how long users will suffer through a download. The answer is roughly 20 seconds. After 20 seconds, they become impatient and start thinking about doing something else.

The time to download content depends on a variety of factors, many of which are beyond the app's control. What can you do to make sure that your users will not abandon your app?

1. **Display a progress bar (not a spinning gear).**

   Even though you may estimate that your content will download in a millisecond, it's absolutely vital to display a progress bar that tells users clearly how far the download has progressed, and, very importantly, that the app is working.

   One of our users waited for more than 10 minutes for an issue of Vanity Fair to download (or at least, that's what she thought). In fact, the app got stuck before the download had even started; the app kept displaying a spinning gear and the user was wondering whether it was really working or whether there was a problem with the app.

2. **If, once the user has started it, your app needs more than 20 seconds to download content and become fully functional, think seriously about how you are going to entertain the user during that download time.**

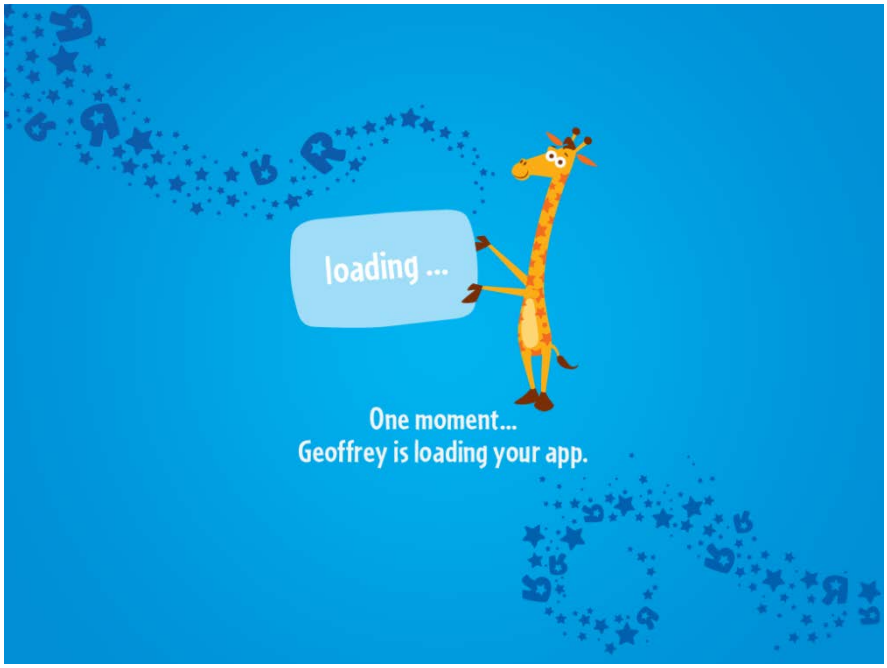
   Some possible suggestions include:

   - Show a preview of the content that is downloaded;
   - Show content that is downloaded so far;
   - Show instructions and tips about how to use the app. Indeed, from our smartphone research, we know that, although people don't care much about instructions, they will read tips if they don't have anything else to do.

SPLASH SCREENS, NOISE, AND VIDEO

Beside horizontal navigation, splash screens are another ancient-Web practice that has suffered a revival in the iPad era.

Re-baptized as launch screens, the splash screens often contain no information about how long the app is going to take in order to load, no progress bar, and, moreover, have no relationship whatsoever to the first screen of the app.



Toys'R'Us launch screen.

Washington Post launch screen.

Many apps feel compelled to start with elaborate graphics. Sometimes complex animations that can take quite a few seconds are involved. Whereas a cute animation can bring a smile the first time the apps is started, by the fifth time it becomes annoying.

Some apps take a step beyond and add video or noises to the splash screen. Wired is often guilty of this technique, but other apps such as Martha Stewart Makes Cookies and Al Gore's Our Choice also start by playing a video. Others, such as Boutiques and Gilt, make a noise when the app is started. We strongly advise against startup sounds. Users do not expect to hear noises when they start an app (and often they may do it in circumstances where noises are inappropriate — imagine a "Welcome to MovieFone" heard suddenly in the middle of a meeting).

The first time Al Gore's app Our Choice starts, it shows a video of Al Gore.

Martha Stewart Makes Cookies (Lite) starts the first time with a video of Martha Stewart, followed by an animation involving cookies and the letters in the word "Cookies". The animation is present each time the app is started (although the video is not); the app takes about 1 minute to start.

So, what should you do about launch screens?

- **If you must have one, follow Apple's recommendation and make it as close as possible to your first functional screen.**
- **Do not use animations, noises, and videos when the app is launched.**

INSTRUCTIONS AND TIPS

Some users do read instructions. They might even deliberately seek them. They typically are the users who feel more unsecure and less experienced (perhaps they just have acquired an iPad). (From our research on the Web, we find that younger children, who have less experience with the Web, tend to read instructions more than children who are older. Older, less experienced adults also process websites more carefully than younger adults and sometimes are able to complete tasks that more experienced users might fail.)

However, some users do not care about instructions and will simply ignore them, skipping quickly through instruction pages to get to the content. As one user put it:

> "I will always skip the instructions - where is the fun if you have to read the instructions?"

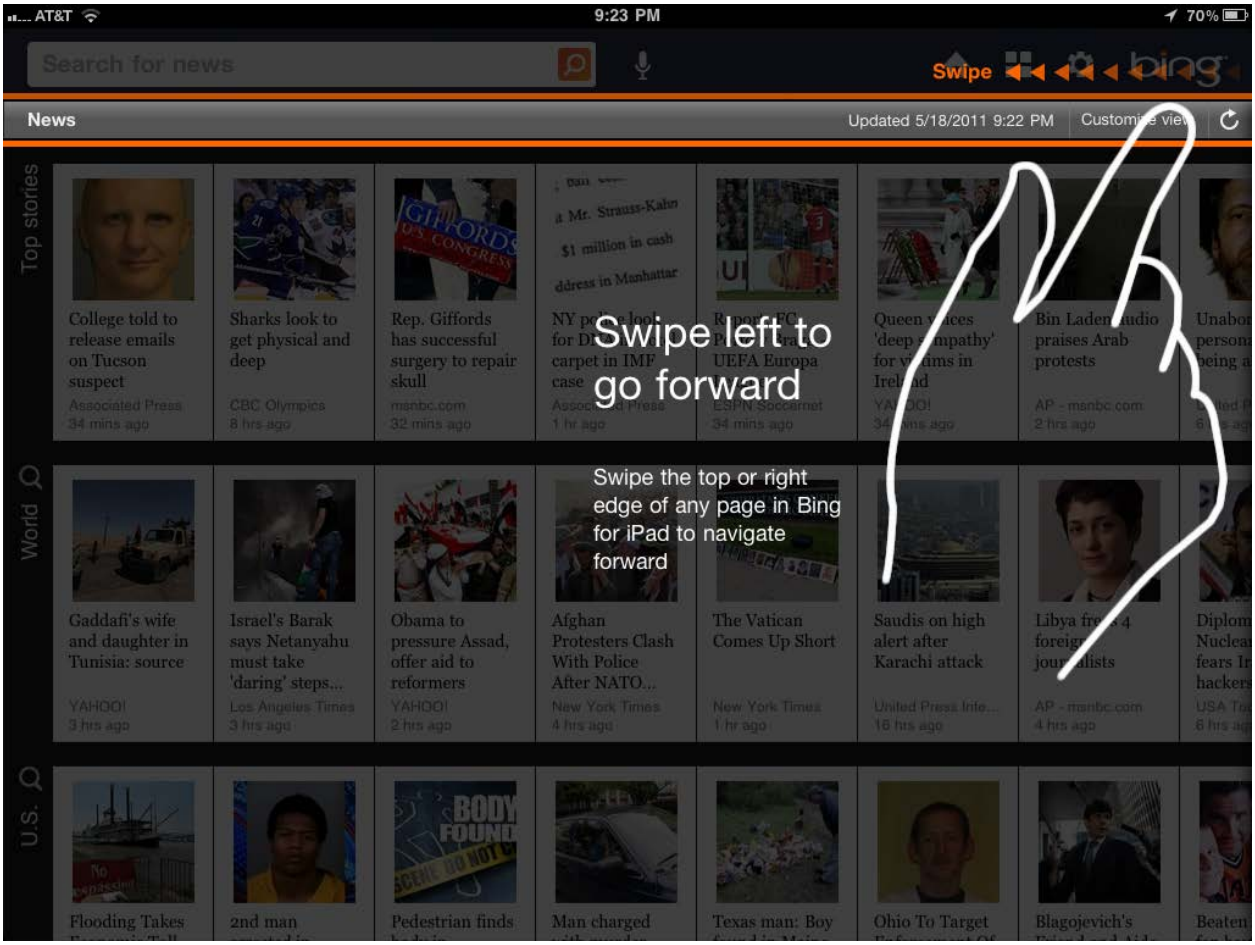
Indeed, where's the fun if you have to study in order to use an app?!

Even people who don't read instructions normally may do so in two circumstances:

- If the instructions are shown during a dead time, when they must wait for content to be downloaded; or

- If the instructions are so simple that they can get the gist of the instruction without actually reading them.

The gentleman who said that he never reads instructions actually dismissed quickly the tips that Bing showed about using the swipe to move back. However, the tips were graphical enough that he got the information in the tip without actually having to pay a lot of attention to the message. Immediately after, he tried the swipe gesture and was able to use it successfully.



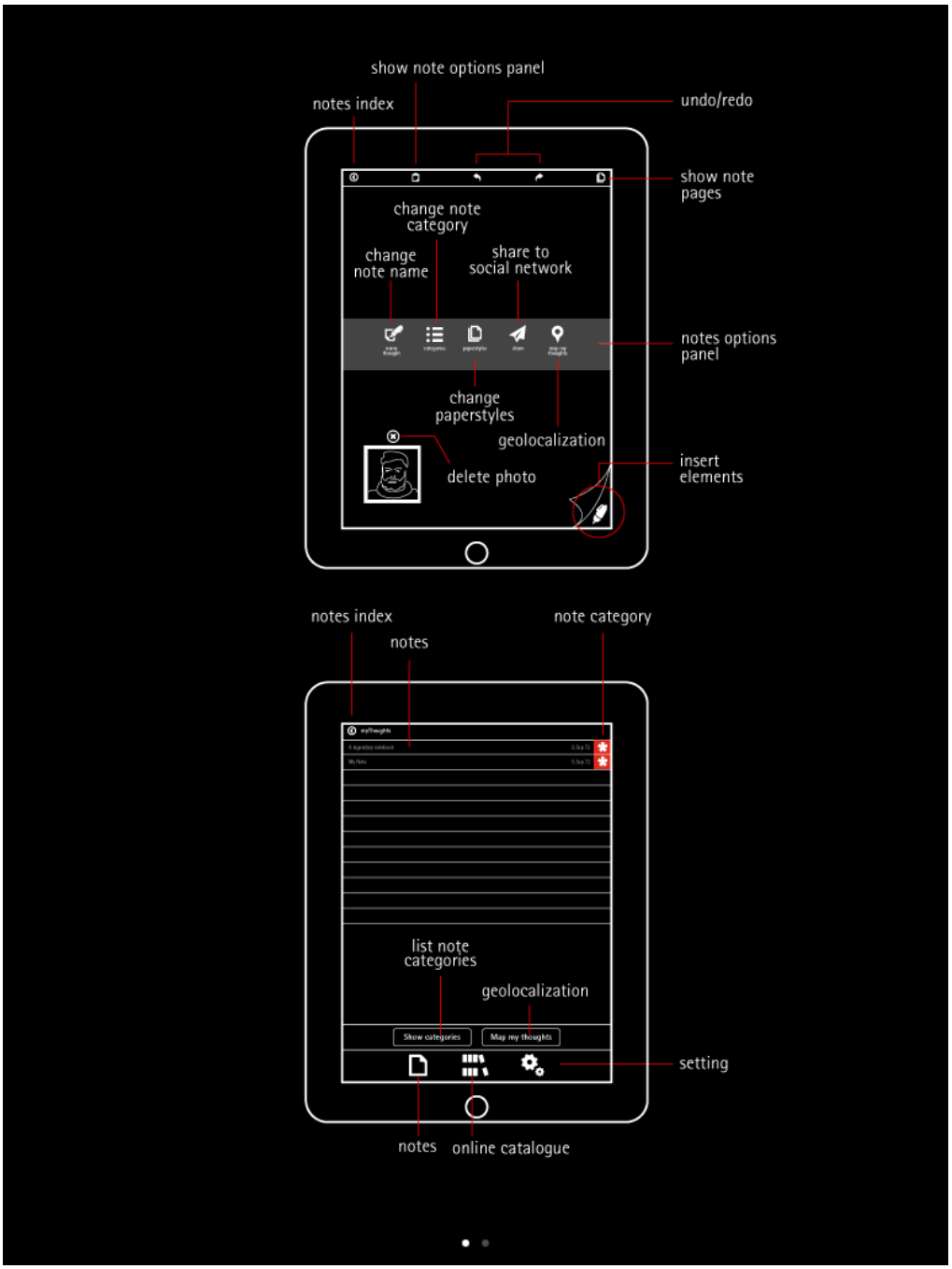
Bing instructions are clear and simple. They focus on a single feature.

Ideally, the app should be functional without instruction. If you must use instructions, they should be memorable and simple. Do not swamp the user with a lot of information at a time; have that information available, but never force the user to sit through it, especially when the app is first launched.

Moelskine starts with a page of instructions the first time is started. Unfortunately, users do not have the patience to delve into the details of those instructions. Nobody is going to memorize what all those options do. It's better to focus on one or two features that are important to get the task started. For instance, the Moleskine

instructions do not talk at all about the most important thing in this app: the workflow. That was a major problem with the app, but even users who went back to the instructions did not get help on that issue. As one use put it:

> "This isn't helping me. I am not sure how to start drawing."



Moleskine instruction screen.

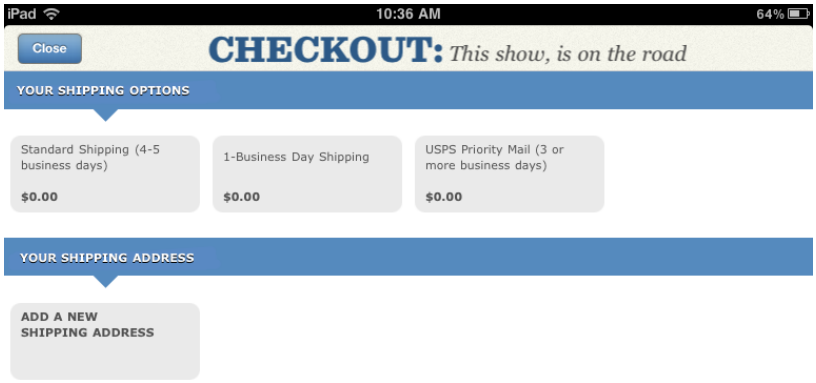
To summarize:

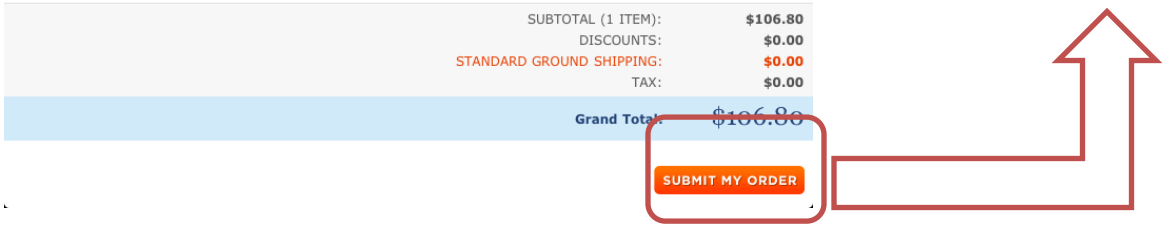
- **If you must use instructions, make them clear and simple.**
- **Focus on a single feature at the time. Present only those instructions that are necessary for the user to get started.**

Workflow

Occasionally in our testing, participants ran into problems because the workflow was not transparent enough: users did not know what to do next, how to approach a task, or what they saw on the screen did not match their expectations.

In the Zappos app, one of our users who had just created his account was trying to complete a purchase. He was confused about where to enter payment information. When he taped the checkout button again, he got a message asking for payment info and he wasn't sure where to put it.

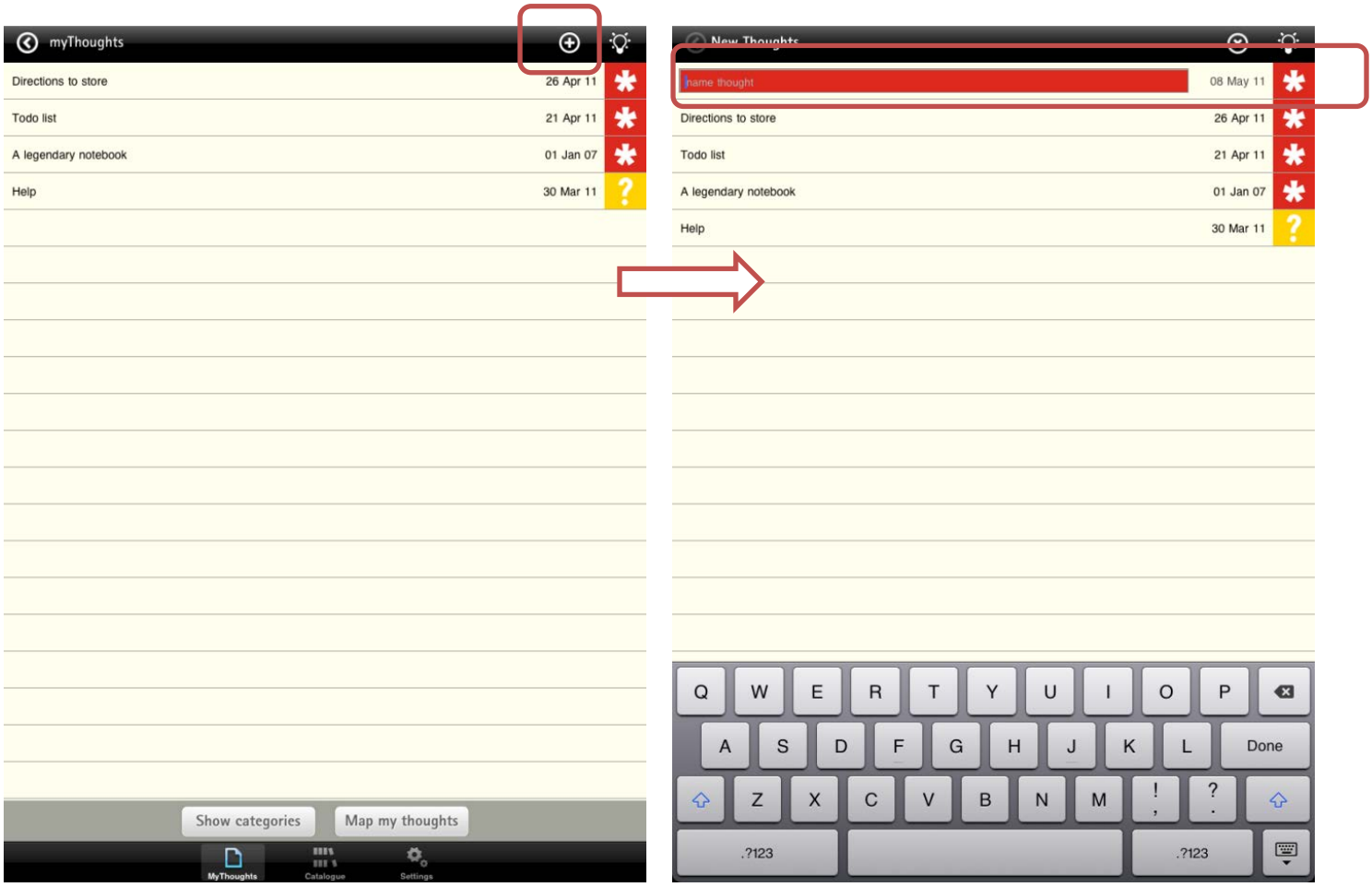




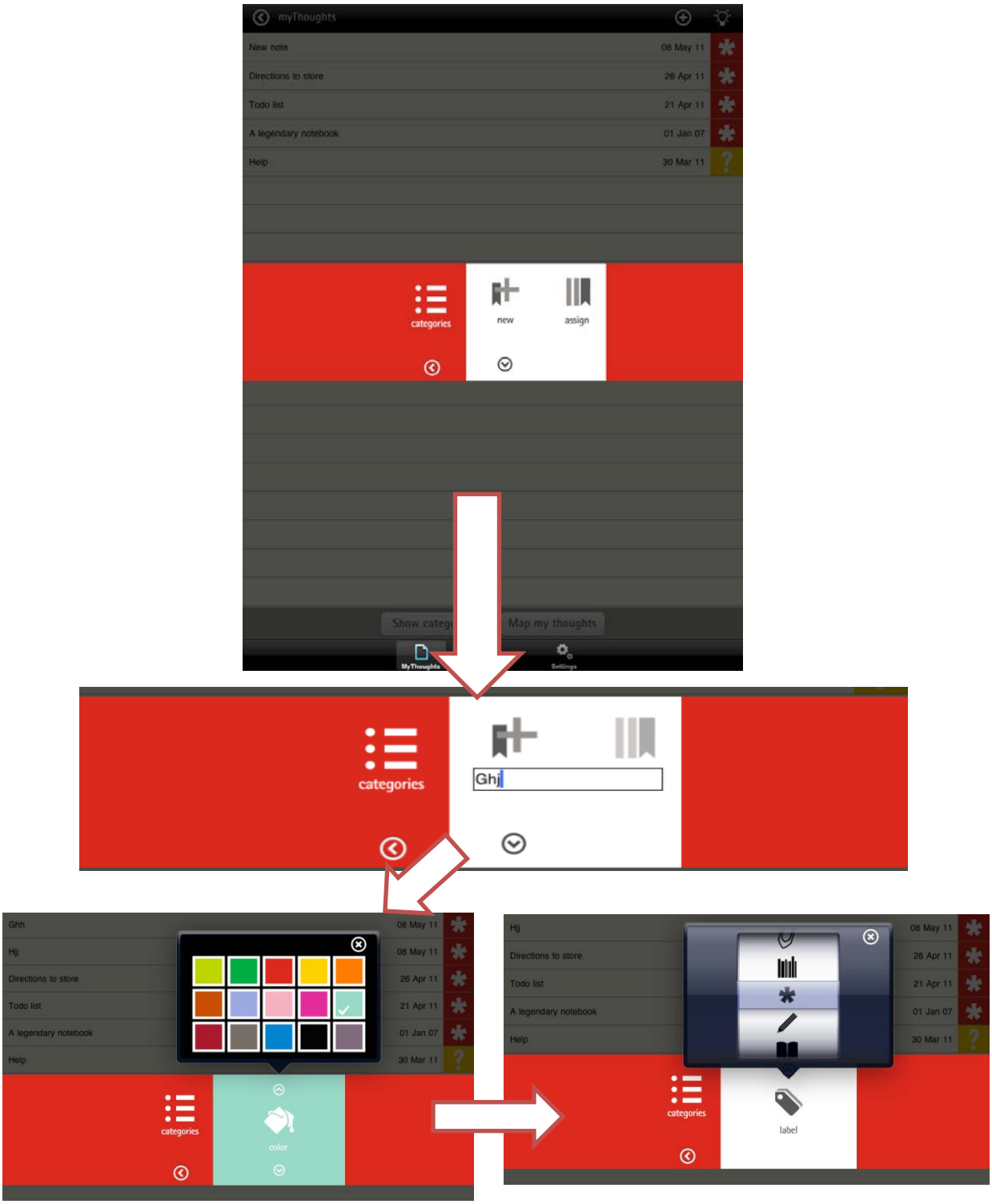
Zappos.com. One of our users was confused because he didn't know where to enter the payment information. The problem was amplified by the fact that when he pressed "Submit my order", the error message talked about a payment method.

The app was in fact expecting the user to fill in the shipping address; after that, it would have displayed its request for payment info. But the user was worried because there was no clear indication that he would do that later.

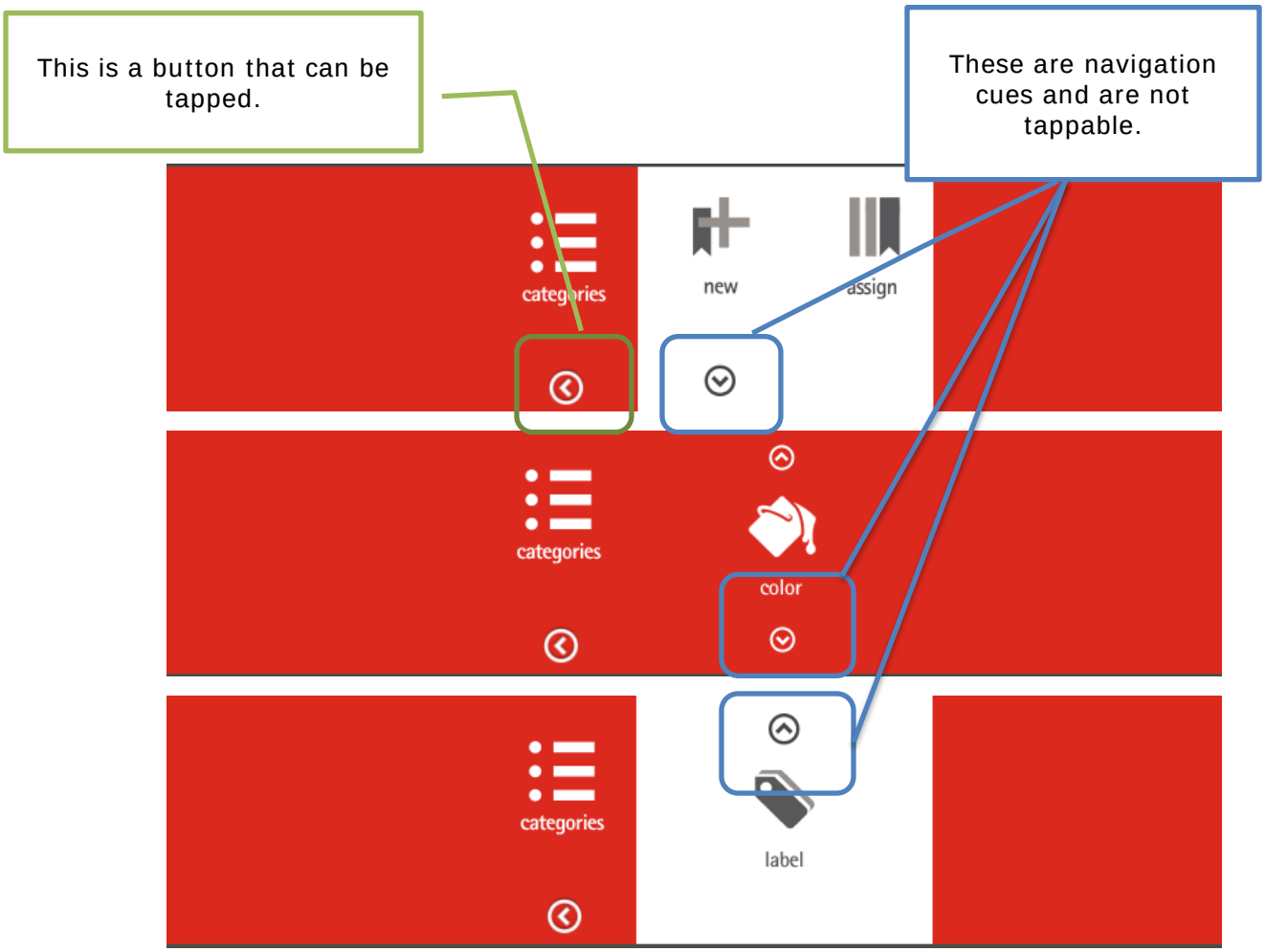
Moleskine, a note-taking app, caused a lot of troubles for our participants. They struggled to figure out how to create a new file. When they pressed the little plus icon at the top, a new line (highlighted in red) appeared at the top of the list of files. Several users did not notice that they were supposed to enter something in that line. Those who did were confused by the options they saw next: selecting a category or creating a new category for the new file. As if the convoluted workflow was not enough, some of the arrows on the selection screen were supposed to be buttons and some were supposed to be navigation cues.



Moleskine. When users press the plus icon in the top navigation bar (left), they must enter the name of the new file in a line above the list of files (right).



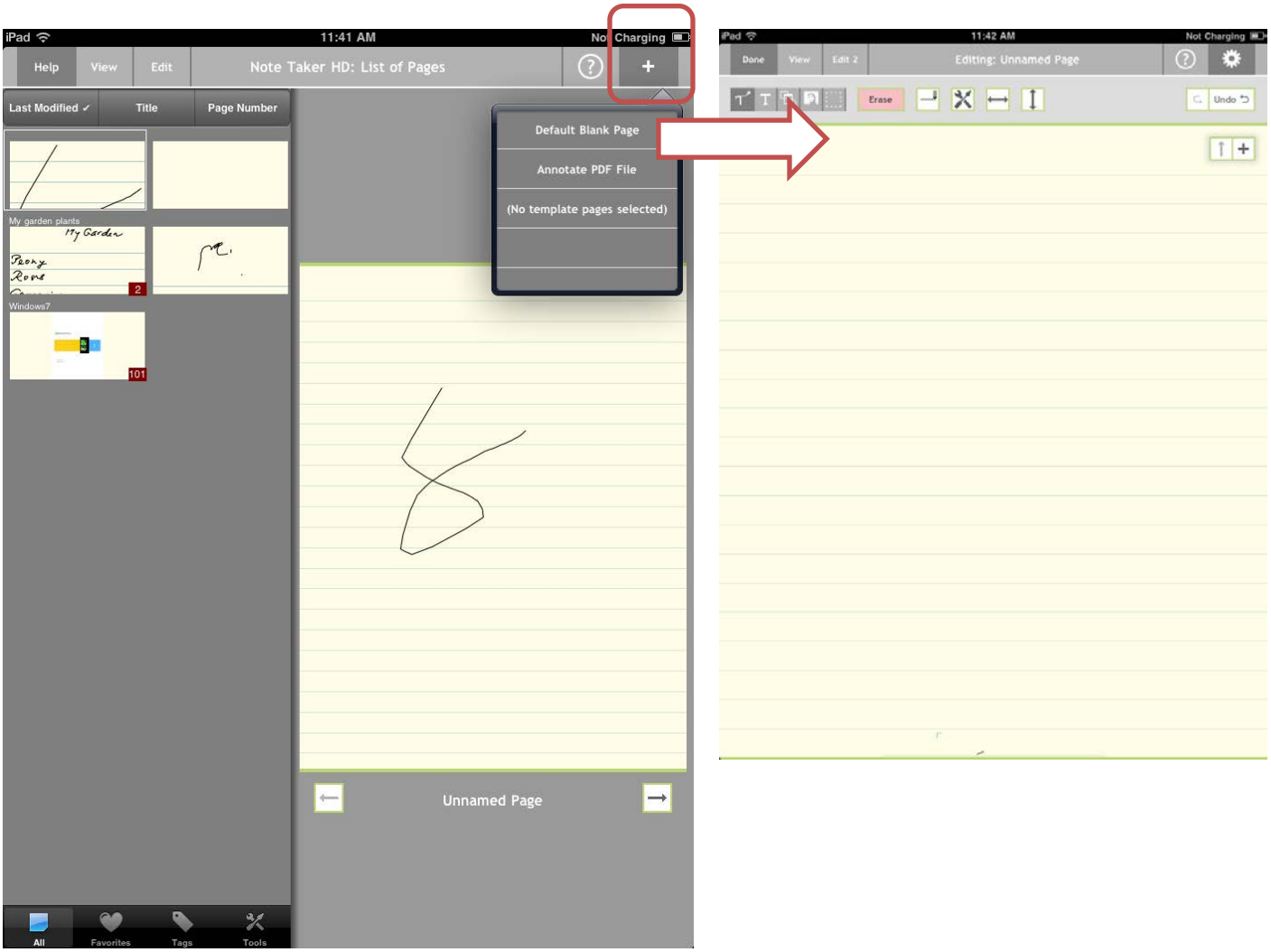
Moleskine. Creating a new file: users have to create a new category for the file, select a color for that category, and finally a label for the category.



Moleskine uses controls inconsistently. The same arrows can either be targets that need to be tapped or they indicate the direction of navigation (and users have to scroll down or up to select the next option).

Users shouldn't be forced to make decisions about non-essential tasks (e.g., category, color scheme, label, and even file name) when they are trying to draw or write down a note.

The flow in the NoteTaker HD app is much more natural. The app lets user start drawing almost immediately; later on, when they are done, they can concern themselves with more sophisticated decisions.



Note Taker HD. When users tap on the plus icon, they need to select if they want to start with a blank page, then they can start writing right away.

The design and the positioning of the elements on the screen need to support the task flow. Controls that are related should be grouped together.

In the Wine.com app, all the search fields are at the bottom of the screen. The “Go” button that starts the search is above those fields, contrary to the natural direction of flow (going down the page). Because of that (and of the busy background that blends in with the background for the “Go” button), our participants needed some time to find that button and initiate the search.

Wine.com. The "Go" button is above the search fields. It also blends in with the background and was not noticed by some participants.

Let's summarize:

- **The task flow should start with actions that are essential to the main task. Users should be able to start the task as soon as possible.**
- **The controls that are related to a task should be grouped together and reflect the sequence of actions in the task.**

Case Study: Magazines on the iPad

Many of the magazine apps we evaluated have made a lot of improvement compared to last year's design. We found that, whereas last year there was a frenzy of new gestures and attempts to create an "immersive" experience that lacked any visible interface widgets, today's magazine apps have made some compromises and consequently meet users' expectations better. We were happy to see that several of the recommendations made in the first report were followed: the navigation is more transparent, almost all magazines have one-tap access to tables of contents, they include a back button, and make a lot more use of hyperlinks, on the cover and elsewhere throughout the magazine.

The previous sections in this report discuss some of the issues that still generate problems for the users: the swipe-based navigation, the lack of consistency in content and navigation across orientations, the long downloading times. Here are a few more design elements that can cause difficulties.

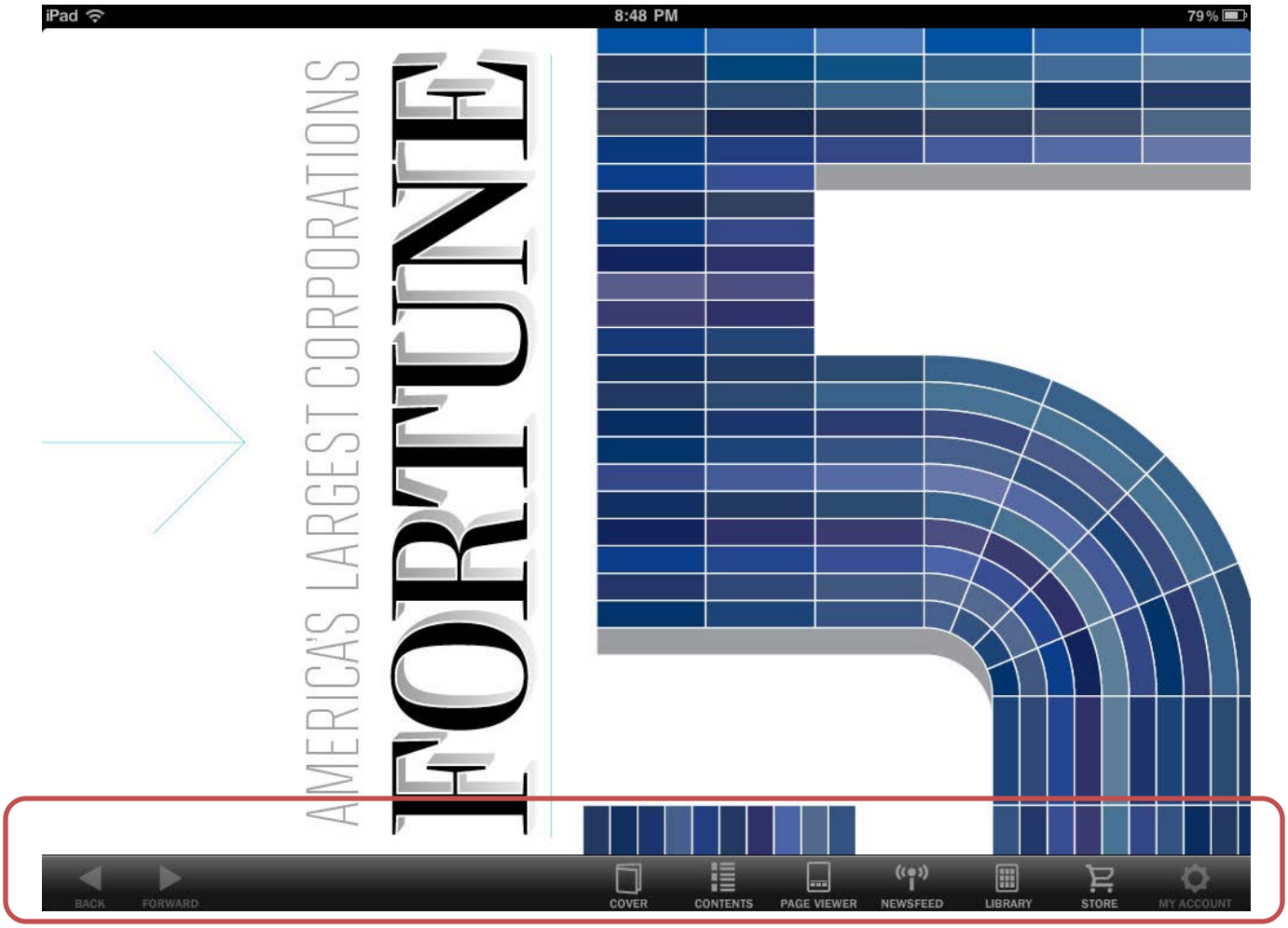
NAVIGATION BAR

To make the experience more immersive and the magazine app look similar to a paper magazine, many magazine apps have one or two navigation bars that are hidden. These navigation bars are displayed if the user taps on the page. (Sometimes tapping in the upper or lower part of the page is necessary to make the navigation bar show up).

When participants were shown these navigation bars immediately after they loaded a new issue, they were more likely to know how to use them. When apps such as Wired did not show these navigation bars in the beginning, users had a harder time finding them — sometimes they first browsed through the magazine pages and an accidental touch revealed the navigation bar. In some cases (for instance when a user showed us his version of Food and Wine), the user never discovered the navigation bar.

Food and Wine. The navigation bar is exposed by tapping on the screen; some users did not discover it.

Fortune uses a visible navigation bar, that is present on the screen at all times — users are just one tap away from any of the navigation options available to them. The Daily's navigation buttons are also shown at all times.



Fortune. The navigation bar is always visible.

Navigation controls are always visible.

TABLE OF CONTENTS

In a paper magazine people rarely use the table of contents: they typically just browse through the magazine, even when they search for a specific article. Unlike for paper magazines, users of iPad magazines tend to use the table of contents a lot more: they often go back to it to find articles and treat it as hub, even when given ample time and no definite task other than finding some articles of interest.

Because the table of contents plays a much more important role in magazine apps than in paper magazines, it is important to make it

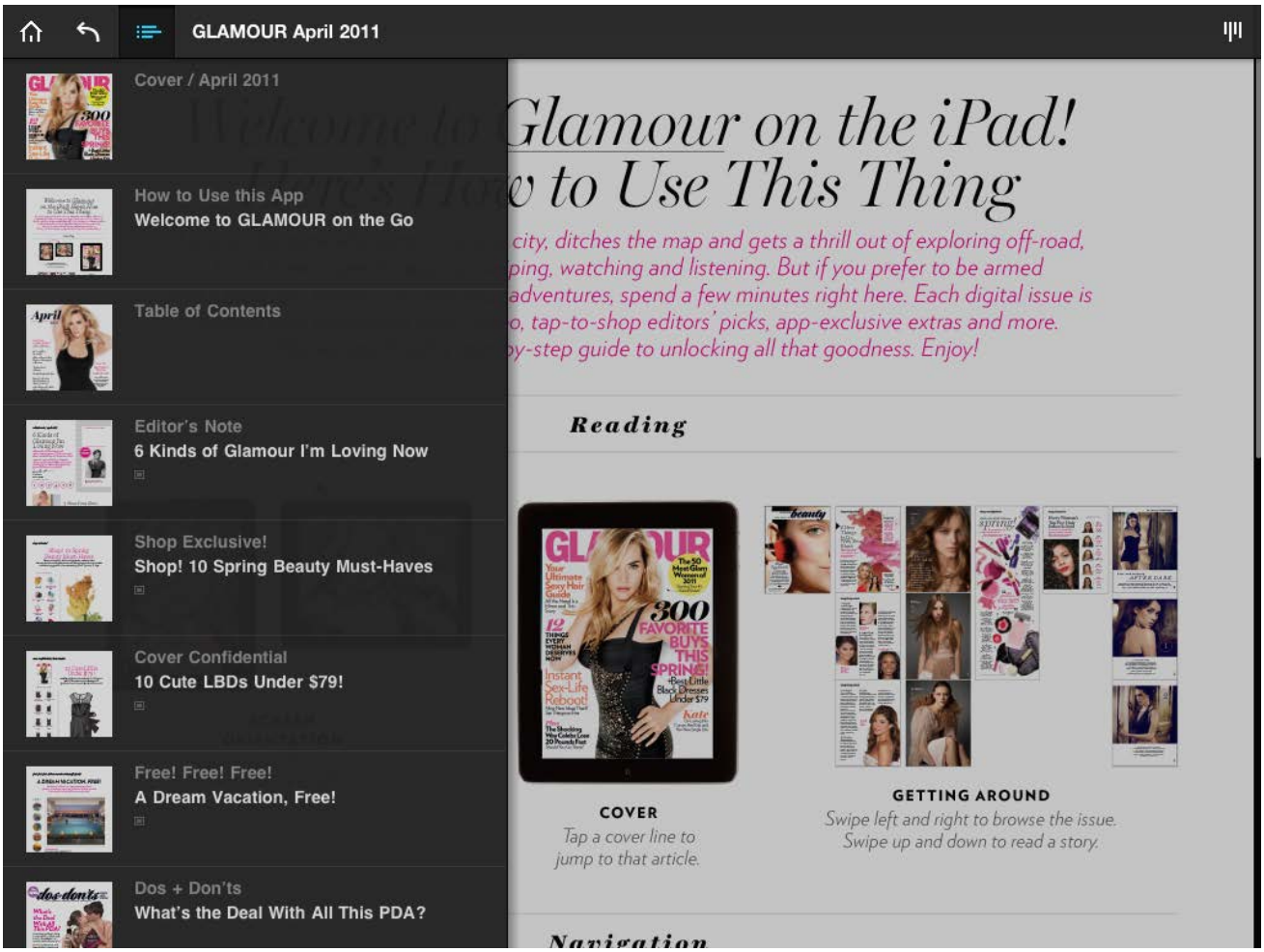
(1) easy to access, and
(2) easy to scan and to read.

Indeed, whenever users did not have a direct link to the table of contents (in apps such as The Daily or Esquire), they complained — they were annoyed to have to flip through the magazine or through the page viewer in order to find the page containing the table of contents.

Esquire. The contents tab opens the article-viewer carousel at the bottom instead of going to the table of contents as recommended.

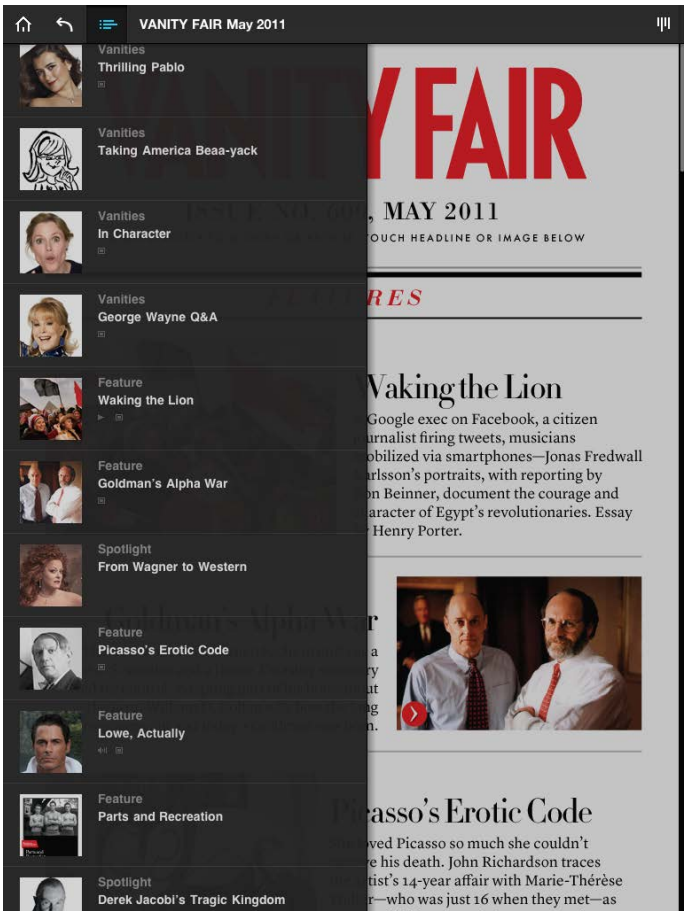
Some apps (Time, Fortune) make the Contents link point directly to the table of contents page in the magazine. Others (examples include Wired, Vanity Fair, Glamour, The New Yorker) show a popover with all the different article titles.

Fortune. Tapping the contents link in the navigation bar takes the user to the table-of-contents page in the magazine.



Glamour. Tapping the contents icon opens a popover that contains article titles.

The Contents popovers suffer from all the disadvantages discussed in our Popover section: first, users have to scroll a lot in a small space, and second, the article titles are usually not explanatory enough for the users to be able to select an article based on them. In our testing, many participants did not bother to look for an article in the popover — they simply selected the table-of-contents article from the popover and went there instead. Compare, for instance, the popover titles with the table of contents descriptions in the latest iPad issue of Vanity Fair (see below).



Vanity Fair. Compare the article information presented in the content popover to the article descriptions on the table of contents page. What is "Goldman's Alpha War"? The ToC blurb tells you; the popover doesn't.

The table of contents in the iPad magazine shouldn't be identical with that in the paper version, because it carries a much bigger load. When users go back to the table of contents, they treat it as if it were a regular Web page: they scan through the content cursorily and they often read just the beginning of the sentences. That's why it's important to create clear, explanatory headlines that convey what the articles are about. The headlines also need to be consistent with other descriptions of the article that the users may have encountered elsewhere in the magazine (e.g., on the cover page). And finally, because users tend to scan text rather than read it carefully, they need to start with content-loaded keywords and be formatted according to the rules of writing for the Web.

One of our users was searching the Wired magazine for an article about cooking the perfect French fries; from the table of contents, they selected "Mad Science: Nathan Myrhrvold's insatiable hunger to solve our biggest problems", based purely on the word "hunger" in the article headline. They did not realize that the word "hunger" was used metaphorically in the headline. (Luckily, the article was indeed about using science to cook French fries.)

Because of that, we recommend:

1. **The navigation bar should contain a table of contents link.**

2. **The table of contents link should take the users to the table-of-contents page in the magazine.**

3. **The information in the table of contents should be scannable, explanatory, clearly formatted.**

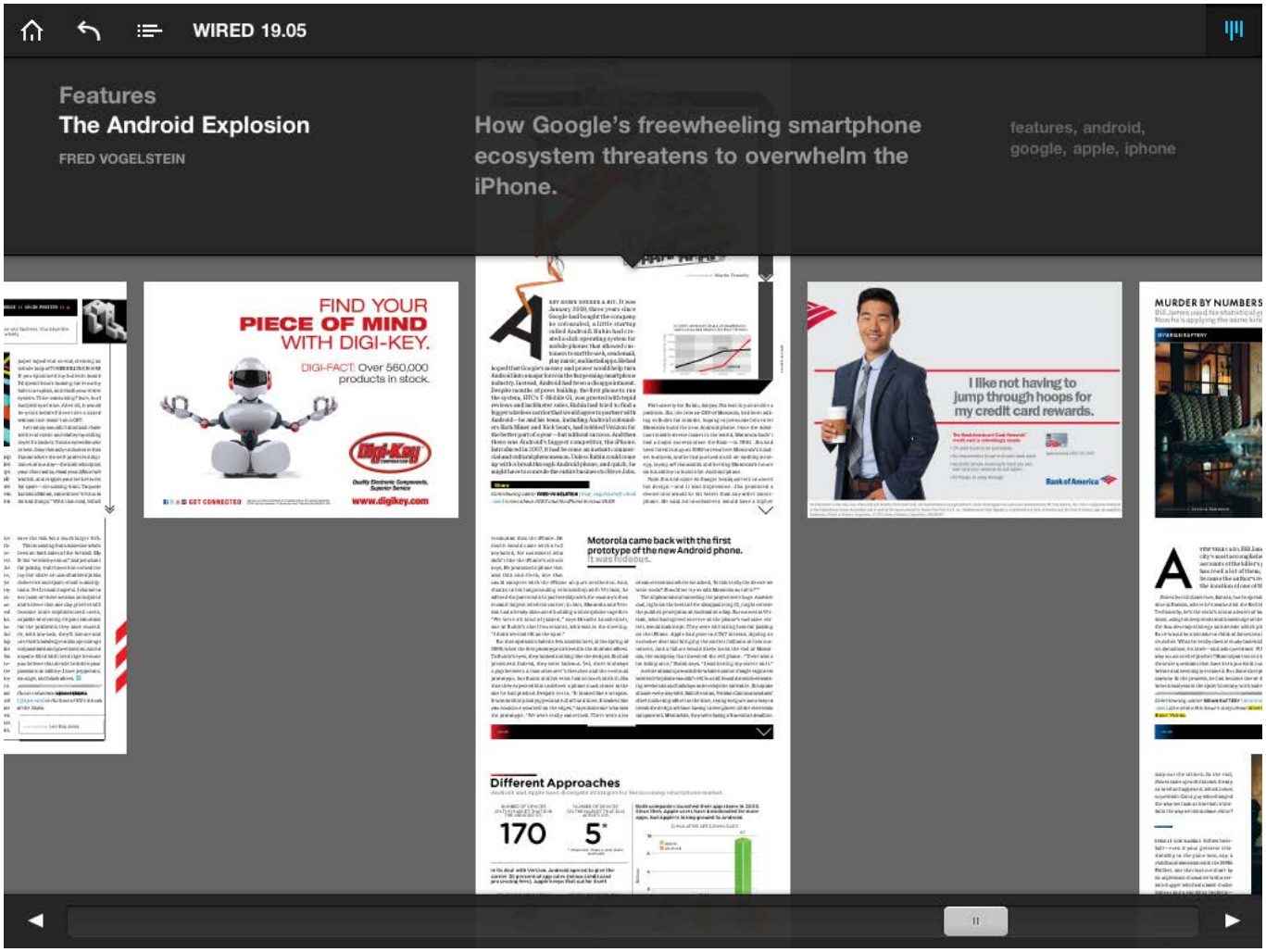
SLIDER AND PAGE VIEWER

Most magazines provide a page viewer for the benefit of the user. The page viewer is essentially a carousel that contains page (or articles) thumbnails; the user can browse through the page viewer or through the magazine directly.

Time page viewer (portrait mode) is a carousel that shows thumbnails of the first pages of different articles.

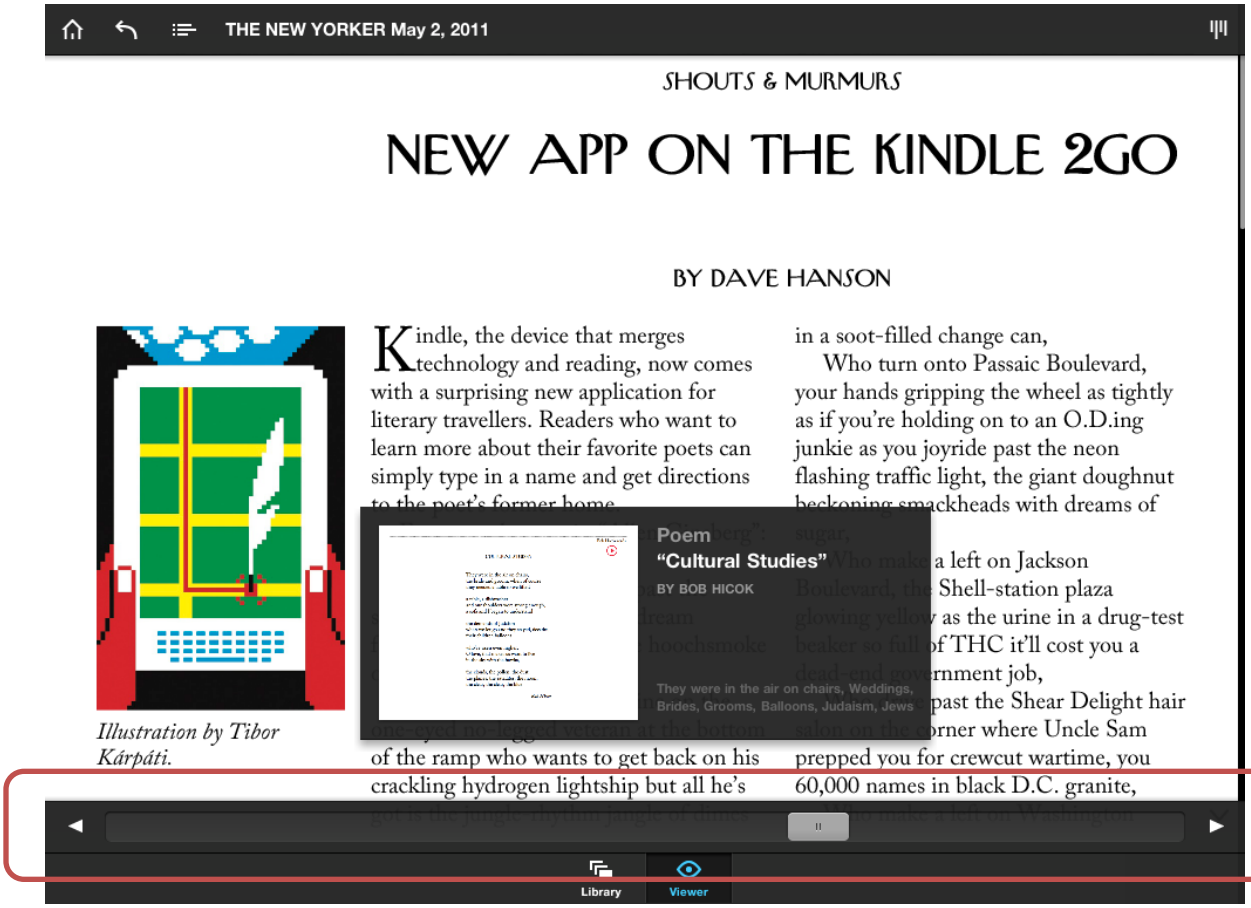
Our participants used the page viewer when they were looking for a specific article (especially for an article that they had seen before and could recognize by the thumbnail). The page viewers can vary in sophistication. Time has designed different page viewers for landscape and portrait mode, to reflect the different navigation schemes in the two orientations (essentially, Time includes a page in the time viewer if it can be reached through a swipe gesture).

Wired has a two-dimensional time viewer that indicates article length, as well as title, description, and keywords related to the article.



Wired has a two-dimensional, detailed page viewer.

Some magazines also provide a page slider that permits users to navigate quickly through the magazine. Almost nobody in our study attempted to use it. (There was one exception, in the old version of the Vanity Fair app: the user did not notice the navigation bar at the top, and struggled to navigate using the slider). The page slider is pretty much useless for several reasons: (1) it offers very little precision (if you want to go to page, say, 30, you will have to fiddle a lot with the slider), so basically it can only be used for navigating to a random page; (2) users don't care to navigate to a random page; (3) its functionality can be much better accomplished with the other navigation tools already available (table of contents and page viewer); (4) it is hard to use (the user needs to keep his finger on the slider as they look at the pages).



The New Yorker. Sliding the finger on the page slider shows a box with an article title and thumbnail.

Because of that, we recommend:

Do not use a page (article) slider.

SEARCH BOX

None of the magazine apps that we tested or reviewed had a search box. Users repeatedly asked for search boxes in the magazines: they wanted to be able to quickly access an article that they had read a while back, as well as articles that were perhaps recommended by friends and colleagues.

A search box is also a marketing opportunity for magazines. We think its place should be in the library of available issues.

Users who could not find the content they were looking for could be directed to results that are present in other magazine issues that were not downloaded or on the magazine website. In the absence of an Internet connection, the search could limit itself to the issues that are already downloaded on the device.

MULTIPLE NAVIGATION SCHEMES

One final word about navigation in magazines: Most magazine apps today seem to have settled for a dual navigation model: swipe to get to the next article, scroll vertically to read

the article. This model takes users some time to discover, but overall it seems not to cause major hurdles, as long as the application uses it consistently.

Problems arise when the application imposes a navigation scheme most of the time, only to violate it occasionally.

In the section on orientation (page 72), we saw examples of inconsistency in navigation across orientations. Sometimes, however, apps use different navigation schemes depending on the article. One frequent culprit is the slideshow article (see the example below from Time): for this type of article, apps often choose to depart from their regular two-dimensional navigation and instead go for horizontal navigation.

Time magazine. Slideshow (as well as a few other articles) violated the normal dual navigation scheme of the magazine. Users tried to scroll down to see more pictures and took some time to figure out that they needed to scroll horizontally.

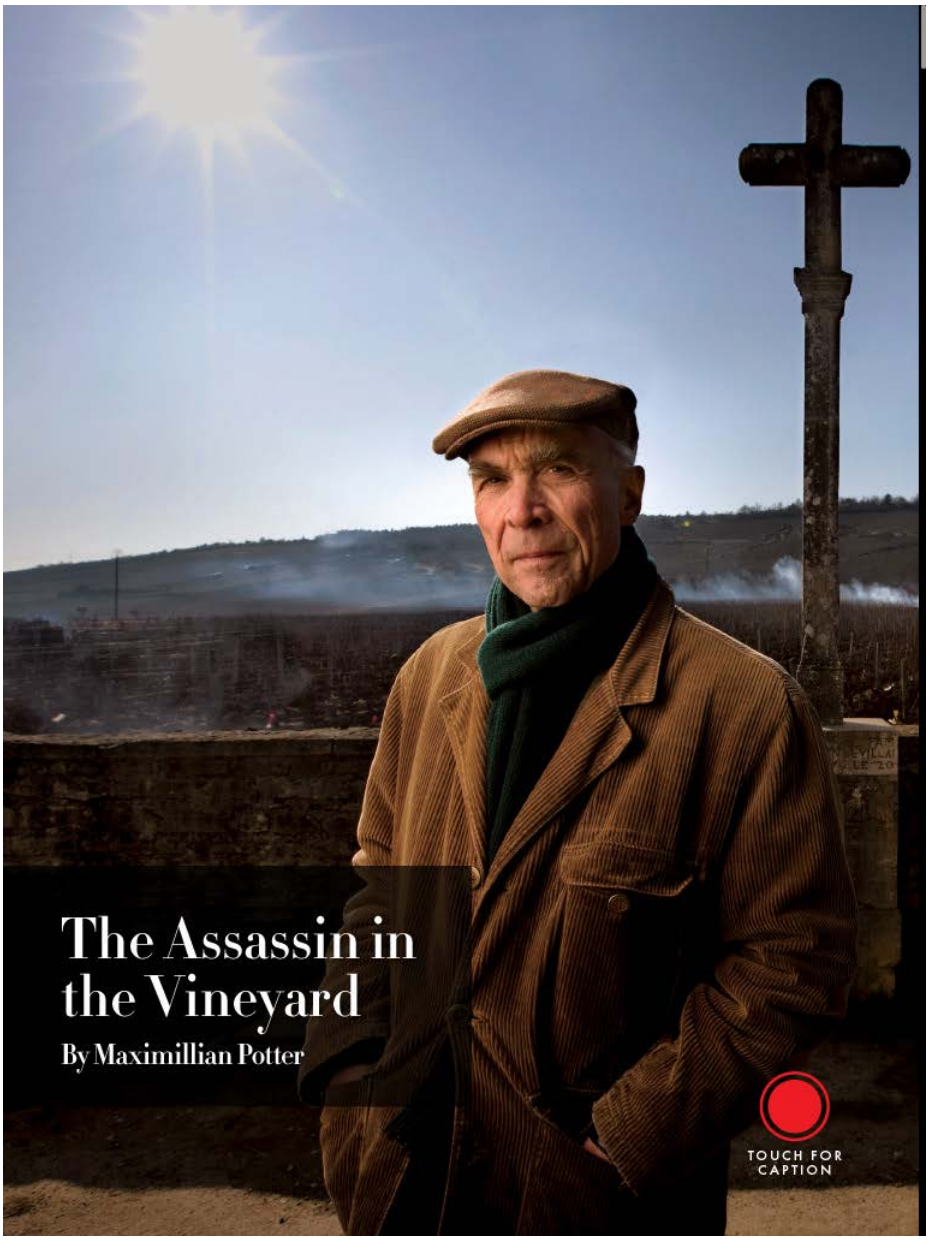
In conclusion:

- **Do not use multiple navigation schemes in the same app (in different orientations or in one orientation).**

- **Do not use horizontal navigation for your slideshow if your app supports a two-dimensional navigation scheme elsewhere.**

SPLASH ARTICLE PAGES

In a dual navigation model, users often browse horizontally through the magazine, looking at the different pages and deciding whether they want to scroll down to read more. Because of that, it is important that the first page of the article conveys the right information about the article. Often a picture, as well as a paragraph, is necessary to give users enough detail about the article content. Users can read the paragraph and get absorbed by the article, or decide it's not for them.



Vanity Fair. The first page of the article is not descriptive enough: what is this article about?

Mind Reading

The new profiling technique that learns exactly what makes you tick—and buy.

BY ELI PARISER

START

W

Welcome, [FIRST NAME], to the era of personalization. Amazon.com recommends books you might like, Netflix tailors your movie menu, and Google customizes your news. And in exchange for this friendly algorithmic assistance, targeted ads follow you wherever you navigate online. ¶ Most of us have accepted this bargain, but it turns out that taste profiling is only the beginning. A technique called persuasion profiling is just around the corner, and it

Wired. The first page shows a picture but also a paragraph from the article. Users can decide more easily if they want to read the article or not.

Methodology

The guidelines discussed in this report are based on two different studies: a traditional usability-testing study using the think aloud protocol, and a design-review study. Next we discuss each of these studies individually.

USABILITY TESTING

Overview

We conducted a traditional usability study using the think aloud methodology. The purpose of the study was to understand the typical usability issues that people encounter when using applications and websites on the iPad. All participants were iPad users who had owned an iPad for at least two months. The study took place at our location in Fremont, CA.

At the beginning of each session, we briefly interviewed participants about their iPad-related practices. Participants also showed us the apps that they had installed on their iPad. Sometimes we created tasks based on the apps that they had installed and asked users to perform them.

In the second part of the session, we asked users to perform specific tasks. A moderator sat next to the participant, and observed, listened, and took notes. Users commented on:

- What they were looking for or reading;
- What they liked or did not like about the site or app;
- What made it easy or difficult for them to accomplish the task.

The participants' interaction with the iPad was recorded using a document camera (Elmo TT-02RX). Each individual session lasted 90 minutes; participants were compensated for their time, as well as for the cost of any paid apps that they were asked to download or any purchases that they were asked to make during the session.

Participants

A total of 16 people participated in our study: 8 males and 8 females. The following table shows the age distribution of the test users.

21–30	31–40	41–50	51+
4	5	5	2

All participants owned an iPad and used it several times per week for a variety of activities. We screened out technical experts and people who worked in usability or marketing, since they were not the target users for the apps and sites we tested and tend to exhibit atypical behaviors due to their expertise.

Following is a partial list of participants' occupations:

- Realtor
- Personal chef
- Commercial property manager
- Office manager
- Homemaker

- VP of Human Relations
- MBA student

Method

Each session was divided in several parts:

1. Participants were asked a few questions related to how they use their iPad:

   "Please tell me what kinds of activities you do on your iPad."
   "Is there anyone else who uses your iPad?"
   "Do you take your iPad with you when you are away from home?"

2. Participants were asked to talk briefly about different apps that they had installed on their iPad. We only inquired about apps that (a) were designed specifically for the iPad; (b) were not games. For some of these apps, the facilitator created some ad-hoc tasks and asked the users to perform them.

3. The facilitator gave the participant one task at a time and asked them to (a) first download the corresponding app if they did not already own it; (b) carry out each task as far as they would if they were on their own. The participant was encouraged to think aloud while performing the task.

Each task involved a specific app or website. For a subset of the e-commerce tasks, we gave participants money to shop for an item that they wanted to buy.

Each participant saw a subset of the available tasks. The order of the tasks was randomized for each participant.

All participants were asked to connect to wireless network at the beginning of the session.

Materials

Ad-hoc tasks. These tasks were created on the spot, as the users were showing us their iPad apps (in part 2 from the Method section). These tasks were similar to tasks that we had planned for our regular usability testing part of the study; sometimes, the tasks were generated based on participant's interest in the topic (for instance, a participant told us that her spouse had fainted earlier that day and that she was worried). The table below displays examples of ad-hoc tasks and the corresponding apps:

APP	TASK
Adobe Idea	Draw a sketch of your apartment.
Amazon Mobile	Find a birthday gift for yourself.
Bloomberg	How do you display your favorite news topics on the first page?
The Daily	Find a story of interest and make sure you can get back to it later.
Fandango	Find a movie you may want to watch during the weekend and buy tickets for it.
Indian Vegetarian Restaurant	Look for a vegetarian restaurant around this area.

Kayak	Book a flight from San Francisco to Dallas for the first weekend in June.
Netflix	Add a movie to your instant queue.
NPR	Listen to the last “Science Friday”.
USA Today	Check the latest entertainment news.
WebMD	Your spouse fainted earlier today. What might he have?

Tasks. The following table shows some of the tasks that we used for the study (in part 3 from the Method section). All the apps that we tested were specifically designed for the iPad. For some of the apps, we had users do the same task both using the app and the corresponding website — if that is the case, the website is shown in parentheses next to the app name. In those situations, we made sure to balance the presentation order so that the app would be first for some users and the website would be first for others.

APP OR WEBSITE	TASK
ABC News	Check the latest news.
Amazon Windowshop (amazon.com)	Look for a birthday gift for yourself.
Amazon Windowshop (amazon.com)	Look for a flexible iPad keyboard.
BigOven	Find a recipe for lamb roast.
Bing	Check the latest world news.
Bing	You’re going to the movies on Friday night. Find a movie to watch.
The Daily	Find the latest news about the earthquake in Japan.
Flipboard	Check the latest news. Set up the app to show the news topics that interest you.
Fortune	Find an article about the President's plan to deal with the housing crisis.
Fortune	Figure out what makes the largest part of the cost of an airplane ticket.
LightTrack	You want to take a photograph of the Golden Gate Bridge from the vista point. What will the direction of the sun be tomorrow at 12?
Marketboard	Check the stock price for Bank of America. How did that change in the past year?
Martha Stewart Cookies Lite	You have 1/2 pound of chocolate that will expire soon. Find a recipe where you could use it.

Moleskine	Imagine you need to explain to someone how to get from your house to the grocery store where you normally shop. Make a sketch to help that person remember how to get there.
NASA	Find more info about Mars. When was water discovered on Mars? Does it have any moons and how are they called?
NASA	Find some pictures taken by Cassini, a spacecraft that has completed several missions to explore Saturn.
Notetaker	Imagine you need to explain to someone how to get from your house to the grocery store where you normally shop. Make a sketch to help that person remember how to get there.
Pennant	What were the most important moments of the game between San Francisco Giants and San Diego Padres, played on Aug 14th 2010?
Pennant	Who pitched for the Giants?
Photoshop Express	Go to Amazon.com and take a screenshot. Crop the upper half part of the picture. Rotate the picture and sharpen the contrast.
Pulse	Check the latest news. Set up the app to show the news topics that interest you.
QVC (qvc.com)	Find a gift under $50 for a friend or a person you care about.
Sears (sears.com)	You want to buy a new dishwasher that saves energy and water, and is as quiet as possible. Find one that satisfies your constraints. Is there a delivery cost? How about an installation cost?
Time	Find the best photographs of the week.
Trulia	Find information about houses that have been recently sold or are for sale in your neighborhood.
Vanity Fair	Find who wrote the different articles featured in the magazine.
Vanity Fair	A friend has recommended an article about the movie “All the President’s Men” starring Robert Redford. Find the article and see if it is interesting to you.
Washington Post (washingtonpost.com)	Check the latest entertainment news.
Wine.com	Friends are visiting from abroad and you want to take them to Napa Valley for a day trip. Find 2–3 really good wineries where you could stop for wine tasting.

Wine.com (wine.com)	Your friend in Pennsylvania loves wine. Send him a bottle of good California wine under $50.
Wired	Find an article about how the perfect French fries are cooked. Can you watch a video about that, as well?
Wired	What does Drano Prevention contain?
Zappos (zappos.com)	Find a pair of shoes under $70 for yourself for the summer. Stop short of actually making a purchase.
Zillow	Find information about houses that have been recently sold or are for sale in your neighborhood.

Apparatus

For testing we used a setup similar to the one in our mobile usability testing and in our first iPad study. A document camera (Elmo TT-02RX) recorded the iPad and streamed the recording to a laptop computer, connected through the camera using an USB port. A webcam was used for recording the participant's face. The webcam was connected to the same laptop. The laptop ran Morae, which put together the two video streams from the webcam and the document camera. The laptop computer was also used so that the facilitator and the observers could follow the participants' actions without invading their personal space.

The iPad was mostly kept on a small rectangular plastic pad, in landscape or portrait position (depending on user preference). Users were free to change orientation of the device and move it around, but we cautioned them that they needed to move it above the plastic pad, to allow us to follow their actions.

DESIGN REVIEW

For the design reviews, one usability expert reviewed the apps and websites mentioned in the task table, as well as other iPad apps and websites. We reviewed many of the apps that were mentioned by the participants, as well as other apps, including:

- Crackle
- AP News
- Boutiques
- Shop Style
- Quickoffice
- Hermitage HD
- Life
- Ansel Adams
- National Gallery Love Art
- Popular Science
- The New Yorker
- Food and Wine
- Glamour
- ESQ
- JCPenney
- Toys R Us
- Sushi HD

- iCircuit
- Newsy

About the Authors

Raluca Budiu, Ph.D. is a User Experience Specialist with Nielsen Norman Group. At NNG, she conducts usability research and regularly presents seminars on a variety of topics, including mobile website design, mobile phone and tablet app design, as well as cognitive psychology and research in human–computer interaction. She also consults for a variety of clients from industry and the government. She previously worked at Xerox PARC, doing research in human–computer interaction. At PARC, she built computational models of how people search for information in visualizations of large data structures. She also explored new ways of measuring information scent and conducted research on interfaces for social bookmarking systems and on the cognitive benefits of tagging. Budiu has also been a user researcher at Microsoft Corporation, where she explored future directions and made strategic recommendations for incorporating user-generated content and social web features into MSN. Budiu has authored more than 20 articles and conference presentations on human–computer interaction, psychology, and cognitive science. She holds a Ph.D. in Computer Science from Carnegie Mellon University.

Jakob Nielsen, Ph.D. is a principal of Nielsen Norman Group. He is the founder of the "discount usability engineering" movement, which emphasizes fast and efficient methods for improving the quality of user interfaces. Nielsen, noted as "the world's leading expert on Web usability" by *U.S. News and World Report* and "the next best thing to a true time machine" by *USA Today*, is the author of the best-selling book *Designing Web Usability: The Practice of Simplicity* (2000), which has sold more than a quarter of a million copies in 22 languages. His other books include: *Hypertext and Hypermedia* (1990), Usability Engineering (1993), *Usability Inspection Methods* (1994), *International User Interfaces* (1996), *Home page Usability: 50 Websites Deconstructed* (2001), *Prioritizing Web Usability* (2006), and *Eyetracking Web Usability* (2010). Nielsen's Alertbox column on Web usability has been published on the Internet since 1995 and currently has about 200,000 readers. From 1994 to 1998, Nielsen was a Sun Microsystems Distinguished Engineer. His previous affiliations include Bell Communications Research, the Technical University of Denmark, and the IBM User Interface Institute.

About Nielsen Norman Group

Nielsen Norman Group (NN/g) is a consulting and research company that is solely focused on user experience. We are not a Web design shop—we will tell you what your customers want and how to vastly increase the business value of your site or intranet, but we won't build the new site for you. We are independent of technology vendors and design agencies, so we can report the unvarnished truth about what works and what doesn't.

Here are some of our most popular services. For the full list (and for current prices), please see our website at www.nngroup.com/services

CONSULTING

- **Independent expert review** of the user experience of your website or intranet: $38,000. (Lower prices for small focused reviews, like a mobile app.)
- **User testing**: typically $25,000 to test a website or intranet; $45,000 for a competitive study. Less for a mobile app or other small UI.

CONFERENCE

We produce an annual conference where world-class experts teach the latest findings about the usability of websites, intranets, and email newsletters. We also teach correct methodology so that you can hone your skills and conduct your own usability projects with more success than if you use weaker methods.

NN/g is the only company that presents high-end usability conferences bringing the same seminars to the United States, Europe, and Australia. For the current conference program, see http://www.nngroup.com/events

TRAINING

Most of our conference seminars are available for in-house presentation at your location. We also have special training events that are optimized for having one of our seasoned usability experts come to your team and teach it usability by leveraging your own design questions:

- **3-day Learning-by-Doing Usability Testing** ($23,000). We take you through a user test of your own design, teaching usability principles with your own project as the case study.
- **Intranet Usability** ($23,000). Combines a full-day tutorial with the lessons from our testing of 27 intranets and a full-day workshop about your own intranet's usability, based on our review of your design.
- **Application Usability** ($16,000). Two days intensive course on everything from screen design (buttons, field labels, widgets) to feature and workflow design.
- **Writing for the Web** ($9,000). A writing workshop using your own sample content for the rewrite exercises.
- **Fundamental Guidelines for Web Usability** ($9,000). The basics everybody should know about users' online behavior and how to design better sites.

PRICES

Prices are stated in U.S. dollars and were valid when this report was published. Travel expenses are extra for all training seminars and for many other services; prices are higher outside the United States. Prices are *subject to change without notice*: for current prices, please see http://www.nngroup.com/services

NEWSLETTER

Free e-mail newsletter published every two weeks with summaries of our newest research and thinking. To subscribe: http://www.useit.com/alertbox/subscribe.html

TWITTER

Follow us at @NNgroup (highly abbreviated feed; missing much newsletter info).

Reports by Nielsen Norman Group

For a full list and to download reports, please see http://www.nngroup.com/reports

WEB USABILITY

- E-commerce user experience
- Wishlists and gift certificates: guidelines for website and email design
- Location finder usability
- Corporate Image: presenting company information in a site's "About Us" area
- PR section of corporate sites: supporting journalists
- Investor Relations area of corporate website: supporting investors
- Site map usability
- B2B: guidelines for converting business users into leads and customers

INTRANET USABILITY

- Intranet usability guidelines: 10 reports based on user testing of 27 intranets
- Intranet information architecture (IA)
- Intranet design annual: published every year about that year's 10 best intranets
- Sector-specific intranets: financial services, manufacturing, technology, retail, knowledge-intensive, and government agencies
- Intranet portals: report from the trenches
- Social networking and collaboration features on intranets

E-MAIL USABILITY

- Email newsletters
- Transactional email and confirmation messages

APPLICATION USABILITY

- Application design showcase: case studies of 10 award-winning app UIs
- Customization usability
- iPad apps usability
- Flash and Rich Internet Applications (RIA)

SPECIAL USER SEGMENTS

- Usability of websites for children (age 3–12)
- Teenagers on the Web (age 13–17)
- College students (age 18–24)
- Web usability for senior citizens (age 65+)
- Beyond ALT text: improving usability for users with disabilities

USER-CENTERED DESIGN METHODOLOGY

- Agile usability: Best practices for user experience on Agile development projects
- Return on investment (ROI) for usability
- Paper prototyping: a how-to video (32 minute DVD)
- 230 tips to improve the way you run user tests
- Recruiting test participants for user testing
- Testing users with disabilities
- How to conduct eyetracking studies

OTHER

- Mobile web usability
- Streams, Walls, and Feeds: notifications, messages, and alerts sent through social networks and RSS
- Non-profit and charity websites: attracting donations and volunteers

Usability Week 2011

July 11-15 | August 1-6 | September 25-30 | October 3-7 | November 13-18

The Usability Week 2011 Conference

Many conferences offer cavernous exhibit halls, brief seminars on second-hand discoveries, and a sense of anonymity that can be truly alienating.

Usability Week takes a different approach.

Knowledge, Directly from the Source

In place of scattered, shallow talks, Usability Week offers 5 or 6 days of deep learning as international experts lead full-day tutorials on topics such as:

- Fundamental guidelines for Web usability
- Information architecture (IA) principles
- Writing for the Web
- Application design
- Designing usable social features
- The human mind (how your users think)
- Mobile websites and touchscreen/gesture apps

Course levels range from introductory to advanced; you can sign up for as few as 1 or 2 days or as many as 6.

Many sessions include hands-on training exercises that let you apply what you learn immediately; all ensure that you'll learn tools you can use to improve your website, intranet, or application as soon as you get home.

Networking Opportunities

Because you'll spend each day in a group with in-depth focus on a single topic, you can discuss problems, share solutions, and make lasting connections with your peers.

Pay only for the days you need. The more days you attend, the deeper the discount. Early bird rates save even more, so sign up early!

Venues

The conference visits several of the world's great cities, providing ample incentive to continue networking offsite at world-class restaurants, clubs, and attractions.

Choose your city at http://www.nngroup.com/events for agendas, location, pricing, and registration information:

- Toronto: July 11-15, 2011
- New York: August 1-6, 2011
- San Francisco: September 25-30, 2011
- Austin: October 3-7, 2011
- London: November 13-18

Who Will You Meet at the Conference?

Companies that sent the most people in 2010 and 2011:

Accenture
Administrative Office of the U.S. Courts
ADP
American Board of Internal Medicine
American Express
Apple
AQA (Assessment and Qualifications Alliance)
AT&T
Autodesk
Banco Itaú
Canada Post
Canadian Grain Commission
Carnival Cruise Lines
Channing Bete Company
Christian Broadcasting Network
Cisco Systems
The College Board
Deloitte
Deutsche Lufthansa AG
Fidelity Investments
Fiserv
Forticom
Gap Inc Direct
Google
Herbalife International
Intel
Intuit
John Lewis
Kaiser Permanente
LexisNexis
Los Angeles Times
Manulife Financial
McGraw-Hill
McKesson
McMaster Carr Supply Company
Microsoft
National Marrow Donor Program
Ontario College of Teachers
Overstock.com
Philips Healthcare
Precision Nutrition
Qualcomm
Quest Diagnostics
Research In Motion (RIM)
Rockwell Automation
Royal Bank of Canada (RBC)
Royal Bank of Scotland (RBS)
Sage

You can also book most of our tutorials for in-house presentation at your company or interest group. Please see
http://www.nngroup.com/services/workshops/

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Sony
State Library of Victoria
T. Rowe Price
TFO (Télévision Francophone en Ontario)
Thomson Reuters
Totaljobs Group
Towers Watson
TVO
U.S. Office of Personnel Management
UEFA
Vanguard
Verizon
VMware
WebMD
Wells Fargo
Wheels, Inc.
Yale University

Mobile User Experience 1: Usability of Websites and Apps on Mobile Devices

- **New York: Thursday, August 4, 2011**
- **San Francisco: Thursday, September 29, 2011**
- **Austin: Monday, October 3, 2011**
- **London: Wednesday, November 16, 2011**

Raluca Budiu and Amy Schade
Full-Day Tutorial

How do we create a satisfactory user experience when limited to a small device?

This seminar is based on expert reviews, as well as international studies with participants ranging from students to early technology adopters and business people using websites on a variety of mobile devices. We also report on the latest findings from articles published in prestigious journals and conferences.

Our user research included smartphones, touchphones, as well as feature phones from several different vendors. The seminar will discuss the issues in designing for this range of devices, with a focus on smartphones and touchphones, since research indicates that these are the primary devices used for mobile Internet access.

In this seminar we target basic mobile usability principles that go beyond any specific phone model.

What You'll Learn

- What behaviors users engage in when using mobile devices
- Mobile app versus mobile website: which is better
- Guidelines and best practices about how to make your website mobile-friendly, with emphasis on:
    - Features that make mobile sites usable
    - Easy navigation on mobile devices
    - Writing and producing content for mobile device

Course Outline

Mobile user behaviors:

- What kinds of activities people do on mobile devices
    - Differences between apps and websites
- Browsing for news, entertainment, sports
- Finding specific information (weather, movie times, etc.)
- Transactions (such as online banking and other financial operations)
- Shopping: what do users shop for on mobile
- Designing to support user behaviors

Design strategy considerations:

- Creating a dedicated mobile site vs. having mobile users access your regular website
- Designing for high-end models vs. the lowest common denominator
    - Direct manipulation UI for touchphones (e.g., iPhone, BlackBerry Storm)
    - Indirect manipulation for low-end devices
- Creating a mobile application vs. a mobile website; when to use what
    - Differences in designing an app versus a mobile website

Basic usability guidelines for mobile sites and apps:

- Basic interaction
    - Typing
    - Dropdown Boxes, Buttons, and Links
    - Lists and Scrolling
    - Menus
    - Carousels
- Forms
- Logging In and Registering
- Search
- Navigation and information architecture (IA)
- Errors
- Page layout
- Search
- Homepages
- Images, Animation, and Videos
- Content usability
    - How users read on mobile devices
    - Writing for mobile use
    - Presenting text: legibility and readability
- Designing for feature phones: differences from smartphones and touchphones
- How to perform usability testing with mobile devices

Format

This full-day tutorial includes lectures, video highlights from user testing, and some exercises.

Handouts

Copies of the presentation slides

Who Should Attend

Anybody who designs websites, intranets, or online services that have mobile users. People in charge of mobile strategy, including the question of whether to develop dedicated mobile services.

What is NOT Covered:

This seminar is solely focused on the user experience and does not cover programming. Although we do discuss nonconventional app interfaces, this seminar is not intended for game developers.

See Also:

This seminar is about the basic usability principles that are valid for both mobile websites and apps and for the full range of mobile devices. A companion seminar, Mobile User Experience 2 focuses on issues specific to designing applications for touchscreen devices.

Instructors

Raluca Budiu is a User Experience Specialist with Nielsen Norman Group. At NN/g she consults for clients from a variety of industries and presents tutorials on mobile usability, usability of touch devices, cognitive psychology for designers, and principles of human computer interaction. She coauthored the NN/g reports on mobile usability, iPad usability, and the usability of children's websites. Budiu previously worked at Xerox PARC, doing research in human-computer interaction. At PARC, she built computational models of how people search for information in visualizations of large data structures. She also explored new ways of measuring information scent and conducted research on interfaces for social bookmarking systems and on the cognitive benefits of tagging. Budiu was also a user researcher at Microsoft Corporation, where she explored future directions and made strategic recommendations for incorporating user-generated content and social web features into MSN. Budiu has authored more than 20 articles and conference presentations on human-computer interaction, psychology, and cognitive science. She holds a Ph.D. from Carnegie Mellon University.

Amy Schade is a Director based in Nielsen Norman Group's East Coast office. Schade works with clients internationally in telecommunications, e-commerce, government, travel, automotive, publishing, banking, non-profit and education, including extensive work on corporate intranets. She has conducted user research and performed reviews on a wide variety of websites in the United States, Canada, Europe, Asia and Australia. She presents tutorials on user testing, intranet usability, writing for the Web, email newsletter usability and mobile usability. She authored the NN/g reports on intranet usability, intranet information architecture, email newsletters, and site map usability, as well as the 2010 and 2011 Intranet Design Annuals, and conducted many user test sessions for reports on accessibility and usability for senior citizens. Before joining NN/g, Schade was an information architect at Arc eConsultancy, where she created and revised architectures for sites ranging from a family-related content site to a transaction-based sponsorship marketplace. Schade has also held various positions in web production and advertising. She has a Master's degree from New York University's Interactive Telecommunications Program and a B.A. in Communications from the University of Pennsylvania.

Mobile User Experience 2: Touchscreen Application Usability

- **New York: Friday, August 5, 2011**
- **San Francisco: Friday, September 30, 2011**
- **Austin: Tuesday, October 4, 2011**
- **London: Thursday, November 17, 2011**

Raluca Budiu and Amy Schade
Full-Day Tutorial

What makes a good application? A new, cool interface? Ease of use? Responding to users' needs? Why do some applications become part of the everyday life of their users, while others are downloaded and never used?

This seminar addresses these questions. In discussing the secrets of a successful iPhone, iPad, or Android app, we use data from our own ethnographic and user-research studies, and from expert reviews. This seminar complements our seminar Mobile User Experience 1, which is focused on basic mobile usability principles that are valid on all platforms. In this seminar we will use examples from existing iPhone, iPad, and Android apps and will focus on the challenges that are specific to designing native apps for touchscreen devices. Although we do discuss nonconventional app interfaces, this seminar is not intended for game developers.

What You'll Learn

In this session, you'll learn:

- How touchscreen users think and what they expect from an application
- Differences between iPhone, iPad, and Android users
- What types of mobile applications people use repeatedly, and which are one-time wonders
- Patterns of application usage
- Design guidelines and best practices for making your application useful and usable
- How to avoid usability pitfalls in mobile user interfaces, including design mistakes made by some pretty famous apps

Course Outline

- Types of applications: immersive, productivity, utility applications
- Using the device hardware to your advantage:
    - How to design for the touch screen
    - Using the gestures and multi-touch in your application
    - Accelerometer
    - Sound and voice recognition
    - User's location
- Consistency with other applications designed for the same device and conventions
    - How to handle borderline cases
    - When can you depart from conventions
- Design primitives

    - Menus and lists
    - Form fields
    - Buttons and controls
- Design guidelines for common tasks
    - Startup screen
    - Logging in
    - Configuration and settings
    - Data input and form-filling guidelines
    - Content: text, images, graphics, animation
    - Error messages and help
    - Saving state and “printing”
    - Editing
    - Search
    - Displaying ads
- Alerts and notifications; online versus offline mode; push versus pull
- Customization and Personalization
    - History
    - Preserving state
- Moving from a computer application to a mobile application

Format
This full-day tutorial includes lectures, video highlights from user testing, and some exercises.

Handouts
Copies of the presentation slides

Who Should Attend
Anybody who designs or considers designing iPhone/iPad or Android applications. A secondary audience would be people who target other high-end mobile devices and want their apps to equal the usability of the best iPhone or Android apps. This seminar is solely focused on the user experience and does not cover programming.

What is NOT Covered
This seminar is solely focused on the user experience and does not cover programming. Although we do discuss nonconventional app interfaces, this seminar is not intended for game developers.

See Also:
The companion seminar Mobile User Experience 1 covers basic mobile usability principles, applicable to all mobile devices.

Separate seminars that focus on application design in general

- Application Usability 1: Page-Level Building Blocks for Feature Design
- Application Usability 2: Dialogue and Workflow Design
- Designing Complex Applications and Websites (note: complex apps will rarely be suited for mobile use)

Instructors

Raluca Budiu is a User Experience Specialist with Nielsen Norman Group. At NN/g she consults for clients from a variety of industries and presents tutorials on mobile usability, usability of touch devices, cognitive psychology for designers, and principles of human computer interaction. She coauthored the NN/g reports on mobile usability, iPad usability, and the usability of children's websites. Budiu previously worked at Xerox PARC, doing research in human-computer interaction. At PARC, she built computational models of how people search for information in visualizations of large data structures. She also explored new ways of measuring information scent and conducted research on interfaces for social bookmarking systems and on the cognitive benefits of tagging. Budiu was also a user researcher at Microsoft Corporation, where she explored future directions and made strategic recommendations for incorporating user-generated content and social web features into MSN. Budiu has authored more than 20 articles and conference presentations on human-computer interaction, psychology, and cognitive science. She holds a Ph.D. from Carnegie Mellon University.

Amy Schade is a Director based in Nielsen Norman Group's East Coast office. Schade works with clients internationally in telecommunications, e-commerce, government, travel, automotive, publishing, banking, non-profit and education, including extensive work on corporate intranets. She has conducted user research and performed reviews on a wide variety of websites in the United States, Canada, Europe, Asia and Australia. She presents tutorials on user testing, intranet usability, writing for the Web, email newsletter usability and mobile usability. She authored the NN/g reports on intranet usability, intranet information architecture, email newsletters, and site map usability, as well as the 2010 and 2011 Intranet Design Annuals, and conducted many user test sessions for reports on accessibility and usability for senior citizens. Before joining NN/g, Schade was an information architect at Arc eConsultancy, where she created and revised architectures for sites ranging from a family-related content site to a transaction-based sponsorship marketplace. Schade has also held various positions in web production and advertising. She has a Master's degree from New York University's Interactive Telecommunications Program and a B.A. in Communications from the University of Pennsylvania.

Writing for Mobile Users: Content Usability for Mobile Websites, Apps, and Email Newsletters

- **New York: Saturday, August 6, 2011**
- **London: Friday, November 18, 2011**

Janelle Estes
Full-Day Tutorial

How do we create well-written and scannable content when limited to a small device?

This seminar will discuss issues about writing specific to writing for mobile devices and tablets, with a focus on smartphones and touch phones, the primary devices used for mobile Internet access. The seminar covers the differences between writing for mobile and writing for tablets where applicable, but the focus will be on writing for the small screen.

This seminar is based on international studies with participants ranging from students to early technology adopters to business people reading content on a variety of mobile devices and tablets.

Writing for mobile devices is similar to writing for websites, except more rigorous. Some of the principles covered in this course are similar to Writing for the Web 1and Writing for the Web 2. However, the focus is specific to mobile use and design.

Course Outline

- **Reading behaviors on mobile devices**
  - What users read
  - When users read
  - Where users read
  - Different usage at different times
- **Writing content for multiple formats**
  - Desktop sites vs. mobile sites
  - Mobile sites vs. mobile apps
  - Email newsletters accessed on mobile
  - Social media
  - Creating consistency across formats
- **Writing content for mobile consumption**
  - Writing for fast comprehension
  - Writing for interruptions
  - Formatting content for scannability
  - Creating legible and readable content
  - Structuring complex content
- **Providing content for various activities**
  - Browsing and exploration
    - News, entertainment, sports

    - Reading for pleasure, killing time
        - Magazines, books, blogs
    - Locating specific details or information
        - Movie times, weather
    - Completing transactions
        - Online banking, e-commerce purchases
    - Shopping
        - Price comparisons, store locations
- **Tips for frequently accessed content**
    - Homepage
    - Landing pages
    - Deep link pages
    - PDFs
    - Newsletters and email
    - Describing applications in the App Store, Android Market, etc.

Format

This full-day tutorial includes lectures, video highlights from user testing, and some exercises.

Handouts

Copies of the presentation slides

Who Should Attend

If users are accessing your content—via your website, mobile site, app or email newsletters—on a mobile device or tablet, this course is for you; Web designers, intranet contributors, online and technical writers and editors, usability engineers, sales and marketing professionals, and managers of these functions. Although there are no prerequisites, a general knowledge of Web usability issues and some general experience with writing are useful.

Related

This course is an extension of Writing for the Web 1and Writing for the Web 2, and is geared towards individuals who create, write, and manage content for consumption on mobile devices and tablets. This course also expands on the basic content findings covered in Mobile User Experience 1 and Mobile User Experience 2. You should also attend the two Mobile User Experience seminars if you are interested in the many additional mobile design issues besides the content.

Instructor

Janelle Estes is a User Experience Specialist with Nielsen Norman Group. She works with clients in a variety of industries and presents regularly about usability methods, email newsletters, writing for the Web, and the user experience of nonprofit websites. She has been the primary researcher on and co-author of several NN/g reports, including email newsletters, transactional email messages, donation usability for non-profit and charity websites, and social media. Prior to joining NN/g, Estes was a research associate on the Customer Experience team at Forrester Research, where she was involved with many research efforts related to user experience and user centered

design. Additionally, Estes has worked as a user experience consultant with companies across many industries, including retail, financial services, healthcare, manufacturing, and telecommunications. Most recently, Estes worked at Chordiant Software as a Human Factors Engineer in an agile development environment. Estes holds a BS in Information Design and Corporate Communication, and an MS in Human Factors in Information Design, both from Bentley University.

Visual Design for Mobile Devices and Tablets

- **San Francisco:** Wednesday, September 28, 2011
- **Austin:** Wednesday, October 5, 2011
- **London:** Sunday, November 13, 2011

Kara McCain

Full-Day Tutorial

The visual design for a mobile device–be it a phone or tablet–can alter a person's perception of the usefulness and usability of your app or website. There are unique challenges to designing for mobile and this course focuses on the nuances creating both beautiful and usable interfaces for your users.

Just because screens are smaller doesn't mean that you can't have an impact on users or that your app or site has to look boring. But it does mean that you must communicate more compactly, raising the bar for good visual design.

What You'll Learn

As a companion to our seminars Mobile User Experience 1 & 2, this seminar focuses solely on the important roles aesthetics and interaction play in the success for a mobile experience.

Course Outline

Visual representation

- Icons–design and usage
  - Icons within apps and sites
  - The icon that represents an app on the phone/tablet's main screens
- Images & videos
- Visual mapping & mental models
- Status & feedback notifications
- 'Special effects,' e.g., transitions, overlays

Interactive elements

- Links & labels
- Buttons
- Tabs
- Sliders
- Toggles
- Carousels

Content

- Fonts & typography

- Scanning & readability
- Forms/form elements

Cross-Platform Design

- Achieving a recognizable style across big and small screens: unifying websites, apps, etc., even if they can't all have the same features
- iPhone, Android, Windows Phone, Blackberry, etc.: should an app look identical everywhere?
- Device orientation: landscape vs. portrait

Format

This full-day tutorial includes lectures, exercises, videos and plenty of inspiring screenshots that we deconstruct to show why they work–or where they fail.

Handouts

Copies of the presentation slides

Who Should Attend

This seminar is intended for anyone working on or managing the user experience of a mobile website or application, including visual designers, interaction designers, information architects and usability specialists. Even if you're not personally creating the design, it's highly useful to know what makes a successfully designed mobile experience. This seminar does not have any prerequisites, other than a general knowledge of mobile devices.

What is NOT Covered

This is not a programming/development course. We do not cover coding tricks for iOS, Android, HTML5, CSS, etc. This seminar focuses purely on the user experience (what is shown to users), not about the engineering required to implement a design.

Instructor

Kara McCain is a User Experience Specialist with Nielsen Norman Group. For more than 14 years, she has been creating innovative brand and user experiences in the search, social media, luxury, hotel, travel, jewelry, telecommunications, professional sports, e-commerce, government, and food-service industries. Her expertise has allowed her to develop and implement highly successful Web and print design strategies for Fortune 500 companies. Before joining Nielsen Norman Group, McCain was a senior visual and interaction designer for Yahoo!'s Search and Social Media division, working on Yahoo! Answers, Local search, and defining the way people integrate social media into search. Prior to Yahoo!, she also led the Web design effort for clients such as Verizon, Pizza Hut, The Ritz-Carlton hotels, the Dallas Stars, Radio City Entertainment and the Zale Diamond Corporation.

Mobile Usability Methods: How to Run Your Own Mobile User Studies

- **London:** Monday, November 14, 2011

Janelle Estes
Full-Day Tutorial

In recent years, we have seen an explosion of interest in development for mobile devices and tablets. Many companies have mobile websites and mobile applications, but how do you make sure that these applications are easy to use and satisfy your customers' needs? The best way to do it is to test your mobile designs with real users.

NNG has conducted a plethora of mobile user research studies since 2000, both for our independent research reports and for consulting clients. We've tested the range of platforms from now-primitive smartphones, over touchscreen phones, to full-sized tablets and e-book readers. We'll report the lessons-learned from more than a decade of mobile usability studies and save you from making the mistakes we made in the early years.

The advice in this course is platform-independent, which has two benefits:

- It doesn't matter whether you develop for iPhone/iPad/iOS, Android, Windows Phone, BlackBerry, or any other platform: you should test your design with users; and the methods for doing so are much the same.
- The methods you learn in this course will help you improve the user experience of any future mobile platform or technologies that may emerge in coming years. Learning good user research methodology is a way of future-proofing your career.

What You'll Learn

- The benefits of testing your mobile platform
- What kind of testing method you should choose: Field studies, diary studies, or lab testing
- How to plan your mobile user testing: Recruiting participants, designing tasks, finding the right equipment
- How to conduct your mobile user testing
- How to analyze your data and report findings
- When it's safe to cut corners and reduce costs and when you must stay true to the methodology to get valid results (the only thing worse than no user research is bad research that produces direct misleading findings)

Course Outline

- Why should you test your mobile platform?
- Setting goals for your user study
- Choosing a user testing method for your platform
    - Diary study
    - Field study
    - Paper and low-fidelity prototyping
    - Usability testing in the lab

- Recruiting participants
    - Number of participants
    - Screener tips
- Conducting user studies in the lab
    - How to make sure your lab is appropriate for mobile testing
    - What equipment you will need
    - Structured versus unstructured testing
    - Types of tasks and how to describe them
    - How to interact with the user
    - Using the “think-aloud” protocol
    - Managing observers
    - Collecting and analyzing the data
    - Reporting the data
- Paper prototyping for mobile
    - What tools you will need
    - Study logistics
- Diary and field studies
    - How to set up your study
    - How to ask for data
    - How to keep participants motivated and engaged
    - How to manage participants
    - Tools to make data collection easier
    - How to analyze and report the data
- Other research methods for mobile
    - Surveys
    - Remote testing
    - Eyetracking

Format

This full-day tutorial includes lectures, exercises, and video clips from our research.

Handouts

Copies of the presentation slides

Who Should Attend

This tutorial complements the other mobile usability courses at our conference. It is intended for anyone who wants to conduct mobile usability tests, or who wants some background in mobile usability methods before hiring external consultants to conduct user research. It will work best for people who have either never conducted a usability test or who are relatively new to the discipline.

See Also

We offer additional courses that are related to this course:

- User Testing is the better choice if you're developing traditional (non-mobile) websites or applications. There is enough overlap between the regular User Testing course and the Mobile Usability Methods course that we don't recommend taking both courses.
- Research Beyond User Testing is not specifically targeted at mobile and the Mobile Usability Methods course does cover the most important methods beyond user testing. Still, the course on Research Beyond User Testing goes into additional depth about a broader set of methods and is recommended as an additional course if you want to conduct substantial non-testing research.
- Selling Usability: Convincing Colleagues, Driving Organizational Change. This course is on how to make the rest of the team pay attention to the research findings and act on them.

If you are an experienced usability researcher who has conducted many usability sessions (not necessarily on mobile), we recommend that you take the Mobile User Experience 1 and/or Mobile User Experience 2 courses instead. These courses report the findings and design guidelines from our research. The Mobile Usability Methods course doesn't present our research findings; it's purely about how to conduct your own research to learn about your own design.

Instructor

Janelle Estes is a User Experience Specialist with Nielsen Norman Group. She works with clients in a variety of industries and presents regularly about usability methods, email newsletters, writing for the Web, and the user experience of nonprofit websites. She has been the primary researcher on and co-author of several NN/g reports, including email newsletters, transactional email messages, donation usability for non-profit and charity websites, and social media. Prior to joining NN/g, Estes was a research associate on the Customer Experience team at Forrester Research, where she was involved with many research efforts related to user experience and user centered design. Additionally, Estes has worked as a user experience consultant with companies across many industries, including retail, financial services, healthcare, manufacturing, and telecommunications. Most recently, Estes worked at Chordiant Software as a Human Factors Engineer in an agile development environment. Estes holds a BS in Information Design and Corporate Communication, and an MS in Human Factors in Information Design, both from Bentley University.